FACTORS INFLUENCING THE ADOPTION OF ENTERPRISE APPLICATION ARCHITECTURE FOR SUPPLY CHAIN MANAGEMENT IN SMALL AND MEDIUM ENTERPRISES WITHIN CAPRICORN DISTRICT MUNICIPALITY

by

KINGSTON XERXES THEOPHILUS LAMOLA

Submitted in fulfilment of the requirements for the degree of

MASTER OF COMMERCE

in

BUSINESS MANAGEMENT

in the

FACULTY OF MANAGEMENT AND LAW
(School of Economics and Management)

at the

UNIVERSITY OF LIMPOPO

SUPERVISOR: PROF GPJ PELSER
CO-SUPERVISOR: PROF OO FATOKI

2021

DEDICATION

I dedicate this work to my beloved daughters, *Queen Vanquesher Lamola and Queen Quayên Lamola* for their precious support, guidance and continuous encouragement throughout the three years of completion of this study project.

DECLARATION

I declare that the dissertation hereby submitted to the University of Limpopo, for the degree of **MASTER OF COMMERCE** in **BUSINESS MANAGEMENT** has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

Mr. K.X.T. Lamola	27th April 2021
Title: Itititials & Surname	Date

ACKNOWLEDEMENTS

- First and foremost, I would like to give all glory to God Almighty, the One who was, is and is to come, for His guidance, protection and strength that He invested for the completion of this study (Revelations 4:8).
- How can I forget both Prof GPJ Pelser and Prof OO Fatoki, for their extensive knowledge and wisdom they shared to enable me to accomplishing this research project? Their enormous expertise on data analysis was an incredible adventure in my study.
- I want to acknowledge awesome and remarkable motivation from my daughters, *Queen Vanquisher Lamola & Queen Quayên Lamola,* for their amusement and thrill when I told them that "Daddy" is a student at the University of Limpopo. They responded thus: "*Wena o kgona go ngwala?* (Do you know how to write?) *O ba phale kudukudu*…" (You excel and surpass their them all with greatest heights…).
- Last but not least, I acknowledge my family, for their support and prayers, plus motivation throughout the execution of this project: you're the best….

ABSTRACT

Increasing consumer demand, customer expectations, and change in technology compel industrial corporations, governments and small medium enterprises (SMEs) to adopt Enterprise Application Architecture (EAA). EAA is a system where the applications and software are connected to each other in such a way that new components can easily be integrated with existing components. This study focused on how internal and external factors impact the adoption of EAA for Supply Chain Management (SCM) in SMEs, located in the Capricorn District Municipality. Data is analysed through a statistical package for the social sciences (SPSS version 25). A quantitative methodology with self-administered questionnaire was used to collect data from SMEs (SMEs owners and managers). In total, 480 questionnaires were distributed and 310 useable were returned. Cronbach's Alpha was used to measure reliability. Data validity is obtained through the use of Kolmogorov-Sminorv-Test to ensuring that the questionnaire was based on assumptions from accepted theories as set out in the literature review. From the research findings, it was concluded that the adoption of EAA for SCM in SMEs depends on internal factors, external factors and perceived attitudes towards the adoption of EAA. The managerial implications of the study is based on actual results such as; (a) Internal factors on owners' characteristics were described as assessment of interior dynamics affecting the enterprise, of which the management have a full control over them, such as employees, business culture, norms and ethics, processes and overall functional activities, (b) The Theory of Reasoned Action (TRA) revealed that behavioural measures on Enterprise Resources that depends on speculations about the intensions towards the adoption of EAA for SCM, (c) Compatibility in Diffusion Theory of Innovation ascertains that Technology Acceptance Models need to be linked with relevant Information System Components to have a functional EAA for SCM, (d) The Theory of Planned Behaviour (TPB) encourages apparent behaviour on control for supplementary forecaster on intentions of employees towards the adoption of EAA for SCM in SMEs, (e) The TPB encourages apparent behaviour on control for supplementary forecaster on intentions of employees towards the adoption of EAA for SCM in SMEs, (f) Consultations with government parastatals or legal representatives of the enterprise would save the SMEs against any unforeseen challenges such as product liabilities, legal costs on lawsuit, tax evasion or avoidance penalties so forth, (g) The Diffusion Theory of Innovation (DTI) proposes that the Perceived Attitudes towards the Adoption of EAA have is affected by behaviour challenges from employees' personal conduct that affect SCM activities within the SMEs, and (h) The DTI on the intention towards the adoption of EAA for SCM provides the competence in limiting some negative thoughts about the integrative phases or steps limiting the adoption of EAA for SCM.

Keywords: Enterprise Application Architecture; Supply Chain Management; Internal and External Factors Affecting Adoption; and Technology Acceptance Models

EXECUTIVE SUMMARY

- Assurance in the adoption of EAA for SCM in SMEs

In recent years several programs have emerged to deal with the challenges in coordinating SCM activities within SMEs based on internal and external factor affecting the adoption of EAA. The present study provides additional evidence with respect to some existing software solutions and websites that are developed in South Africa, that provide the following; learn how to turn an idea into a business, assessing the funding readiness, starting a crowdfunding campaign, accessing FREE accounting software service, have no time to read? By listening to audio books, keeping track of your online reputation, making it easier for SMEs to be found online, taking more useful notes, talk to your customers, monitoring and tracking freelancers and salespeople, keeping in the loop with business news and insuring their mobile phones and laptops (Javan, 2019).

However, what happens when the internal factors, external factors and perceived attitudes towards the adoption of EAA hit the actual adoption of EAA? The suggestion with the adoption of EAA is that SMEs will have to be equipped with factors that affect perceived attitudes towards the adoption of EAA that includes; alternative User-Base solutions, technological aversion and resistance to change. Fortunately, most SMEs currently participating in the adoption of EAA already have electronic for a possible adoption of EAA.

- EAA Benefits

While establishing a new enterprise application of any kind bears risk, connecting SMEs with internal and external stakeholders to address a common EAA problem offers several advantages; a)flexible access for low-income SMEs is broadened with minimal involvement with the actual enterprise design, development and configuration,(b)all SMEs are provided with new markets niches during the introduction phase in product cycle, (c) the concentration of SMEs during weekend services ensures a reliable enterprise base for participation, (d) SMEs' markets are effective in the adoption of EAA that encourages and build the disseminating of EAA education. The program would require minimal start-up cash flow and the mutual partnership between SMEs and service provider(s).

- Proven Success

Similar programs have thrived within the cloud computing publicity, ERP SaaS is receiving more focus from ERP vendors such as ERP market leader SAP announcing SAP by Design, their new ERP SaaS solution (Lechesa, Seymour & Schuler, 2012). The adoption of EAA is driven by amongst other things; (a) perceived risk that include; financial risk, social risk and psychological risk (Fatoki, 2014, Csikszentmihalyi & Larson, 2014, Landgraf, 2016). The ultimate success for the adoption of EAA depends on initial interest of SME owners and level of algorithms to be implemented.

- Immediate Plan of Action

Given the limited financial resources required to adopt EAA for SCM in SMEs to commence with the algorithms the following should be considered; (a) contact at least ten SMEs operating in Blouberg (Bochum) Municipality, Molemole (Dendron) Municipality, Polokwane Municipality and Lepelle-Nkumbi (Lebowakgomo) Municipality to measure interest. (b) Contact the Office of Authorities on innovation initiatives for clarity on how EAA could be adopted through a relationship with the business structures. (c) Target 2-3 potential host SMEs in two lower-income areas. (d) Discuss potential costs structures and feasibility concerns with the adoption of EAA. (e) Evalaute potential funding sources, such as; Vuk'uzenzele, Lulalend, banks and financial institutions for lower interest rate and possible payback period.

TABLE OF CONTENTS

APPENDIXES

Appendix A: List of Abbreviations and Acronyms

ABBREVIATIONS/ ACRONYMS	REFERENT
ASS	Application Software System
BB	Both Blind
CC	Carbon Copy
CHR	Competent Human Resources
CRMS	Customer Relationship Management Systems
DSS	Decision Support System
EAA	Enterprise Application Architecture
EC	Employees' Competencies
EF	External Factors
EIA	Enterprise Integration and Administration
ERP	Enterprise Resource Planning
ESS	Executive Support System
GDP	Gross Domestic Product
HS	Hardware System
IR	Information Resources
IS	Information Security
ISC	Information System Components
ISG	Information System Components Governance
IT	Information Technology
KMS	Knowledge Management System
LAN	Local Administrative Network
MAN	Metropolitan Administrative Network
MIS	Management Information System
SCIS	Supply Chain Integration System
SCM	Supply Chain Management
SCMS	Supply Chain Management Systems
TAM	Technologically Acceptance Models
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TSS	Transaction Support System
WAN	Wide Administrative Network

Appendix B: List of Tables

Appendix C: List of Figures

CHAPTER 1: DEFINING THE RESEARCH

1.1 Introduction

The Supply Chain Management (SCM) is increasingly recognised as a worldwide enterprise functional activity that involves dynamic algorithms for managing internal and external enterprise activities (Stet, 2014; Pashaei & Olhager, 2015; and Fish, 2019). Algorithms are protocols to be followed in the execution of SCM activities, which includes computer programming that are aligned with internal and external users and different enterprise activities (Riezebos, 2017; Suhadak & Mawardi, 2017; and Walport & Rothwell, 2019). In Small and Medium Enterprises (SMEs), the purpose of SCM is to satisfy customers' needs through Information Technology (IT) alignment, integration and collaborated through Technologically Acceptance Models (TAM) (Benade & Pretorius, 2012; Hackman & Knowlden, 2014**;** and Hoque, 2016).

SMEs are entities operating both in the formal and informal sectors of the economy serving as economic instrument for development by providing entrepreneurial spirit with flexibility and adaptability coupled with their potential to face environmental challenges in contributing to employment and tax incentives (Department of Small Business Development, 2019). SCM includes logistics combined with core competencies, cost reductions that involves dynamic algorithms for managing issues on internal factors, n such as, organisational structure and associated relationships, Supply Chain coordination; inter-and-intra enterprise communication; sourcing; manufacturing orientation, inventory and cost management; internal and external factors such as outsourcing, and with the intention of satisfying consumers' needs (Sangam, 2010; Benade & Pretorius, 2012).

EAA is a description of the structure for the applications and software used across the enterprise in which the systems are broken down into sub-systems and connected to each other based on their ultimate relationships and functionalities (Sangam, 2010; Benade & Pretorius, 2012; and Flower, 2018). EAA has become a reliable and dependable integrated system embraced by many businesses universally (Gulati & Baldwin, 2018). One advantage of adopting EAA is that it enables SMEs to take advantage of available and sophisticated technological standards on applications

software systems to be used in SCM (Burson, 2015; Schofield, 2018; and Tagged, 2019). The adoption of EAA can be used to develop interventions in SMEs for supporting software used by internal and external users (Hackman & Knowlden, 2014; and Nimsa, 2016). A list of a few of these software includes Basic Accounting Systems, Cloud Accounting, On-Line Accounting Package for Ease in EAA (Shelly & Vermaat, 2011; Sharma, 2015b; Badenhorst-Weiss, Strydom, Strydom, Heckroodt, Howell, Cook, & Phume, 2016; Vogt, 2017; and Badenhorst-Weiss, van Biljon & Ambe, 2018).

1.2 Background to and Rationale for the Study

In coordinating SCM activities, SMEs face challenges in interacting with suppliers, purchasing organisations, distributers and logistic organisations with different operating systems that need to be customised to have common computability for scheduling and processing business transactions (Badenhorst-Wess, Cant, De Beer, Ferreira, Groenewald, Mpofu & Steenkamp, 2011). EAA is becoming an important tool for resolving the stagnation of enterprises in data and information sharing, particularly in SCM (Misra, Khan & Singh, 2010; and Dempsey, 2017). The adoption of EAA by SMEs reveals a new transformation and evolution of change in modern and sophisticated economies (Rodriguez & Bartual-Sopena, 2015; and Schwab, 2016). EAA improves SCM overall productivity, stock holding, shipping and estimating accuracy.

EAA reduces lead-time, assist with the elimination of wasteful resources, minimises the scope of Enterprise Resource Planning (ERP) and the amount of customisation (Lin, 2016; Fourie & Umeh, 2017; and Sahni, Levine & Shinghal, 2019). EAA is a description of the structure for the applications and software used across the organisation in which the systems are broken down into sub-systems and connected to each other based on their relationships. These relationships include both hardware and software applications (Boshoff, Hair & Klopper, 2015; Lamb, Hair, McDaniel, Boshoff, Terblanche, 2015; and Gujarat, 2017).

The adoption of EAA to SCM in SMEs could be beneficial, but the factors influencing adoption of EAA for SCM in SMEs have not yet been established in South Africa. Factors such as complexities in building the enterprise system, designing and aligning algorithms for enterprise application development, acquiring Enterprise Resources, security of enterprise systems, compatibility of systems, incorporating and integrating different systems, user interface and experience (Ray, 2015; Cohen, 2018; Dascalescu, 2018; Merrick & Allen; 2018; and Sebetci, 2019). Currently, automative data distribution and global infrastructures support the interrelationships among SMEs and external business associates through IT connectivity (DeCenzo & Robbins, 2014; and Nel, Tlale, Engelbrecht & Nel, 2016). To sustain a successful adoption of EAA for SCM in SMEs, it depends on overall activities and support systems (Karim, 2011; and

Grigoriu, 2014). EAA is a description of the structure for the applications and software used across the organisation in which the systems are broken down into sub-systems and connected to each other based on their relationships, that includes both hardware and software applications (Boshoff, Hair & Klopper, 2015; Lamb, Hair, McDaniel, Boshoff, Terblanche, 2015; and Gujarat, 2017). SMEs should have thorough knowledge and understanding on the integration of software and hardware for the adoption of EAA for SCM in SMEs. A software system is used hand-in-hand with hardware system to produce meaningful outcome for business processes that could be used for EAA adoption (Wayner, 2018; Schofield, 2018; and Wayner, 2019).

Applications software include components such as, database programs, word processors, Web browsers and spreadsheets (Beal, 2018a; Zandbergen, 2018a; and Gregersen, 2018). Information System Components are regarded as electronic communications protocols and infrastructure that are inclusive of hardware and software components (Hoque, 2016; and Jacobson, 2018). SMEs adopt EAA for IT developments to operate at an optimal economies-of-scale to assist achieve a successful SCM (Pradhan, 2013). Sustainable EAA adoption include the management of enterprise information infrastructure with specific algorithms to make it responsive, adaptable and receptive to consumer needs and demands (Trinh-Phuong, Molla, & Peszynski, 2012; Hagmann, 2013; and Boykin, 2017).

EAA links demand forecasting for their product and services with management system and process to avoid surplus or deficit (Sharma, 2015b; and Fourie & Umeh, 2017). EAA serves as a fundamental instrument to ease SCM activities in SMEs with appropriate algorithms that are used to provide information regularity and reliability (Walport & Rothwell, 2013; and Ray, 2017). EAA plays a fundamental part as an instrument to ease SCM activities in SMEs for enterprises to reap positive results through insourcing, processing and outsourcing for products and service offerings with ease (Smith, 2013). SCM assists in the execution for information sharing from distribution channels that includes; manufacturers, wholesalers, retailers and customers, in the order-processing and distribution for durable materials, semi-durable materials and none-durable materials at an economically-viable prices (Leong, Tan & Wisner, 2012; and Vdovin, 2017). EAA depends on Information System Components

that need to be well understood, particularly on their features, functionality and processing output (Fahy & Jobber, 2012; De Oliveira & Peres, 2015; and Nazir & Zhu, 2018). SMEs and their business associates in the SCM should understand fully how the relationships among the components of SCM in their daily businesses transactions are incorporated (Fahy & Jobber, 2012; and Juneja, 2019). Convenient software systems are regarded as ready-made applications for personalised computer systems that require compatibility of systems *(*Jacobson*,* 2018; Igrany, 2018; and Beal, 2018). The Application Software System (ASS) minimise operational issues, system errors and cost associated with installation (Schnädelbach, 2010; and Flower, 2018). Internal and external factors force SMEs to be more responsive to changes and unpredictable business environments (Sharma, 2015a). Successful SMEs are based on the understanding of the internal and external factors influencing the adoption of EAA for SCM (Alziari, 2017; and Martin, 2019).

Lack of external financing in SMEs is linked with the general market environment and aspects of equity financing and security guarantees on micro-finance (Trinh-Phuong, Molla & Peszynski, 2012; and Ramlee & Berma, 2013). The adoption of EAA for SCM requires capital requirements for SMEs which is a challenge due to formal requirements on loan securities for technological capacity (Suhadak& Mawardi, 2017; and Maverick, 2018). Moreover, lack of skills development and training, poor Employees' Competencies and lack of formal educational requirements makes the adoption of EEA for SCM in SMEs challenging and demanding (Kruger, 2016; and Travis, 2017).

In some instances, external factors complicates the adoption of EAA for SCM such as; customer and supplier perceptions and attitudes, lack of Enterprise Resources (ER) and poor Information Systems Components (ISC) (Porteous, 2014; and Gregersen, 2018). EAA can overcome internal and external challenges and can be used to analyse the adoption of EAA. Adoption of EAA improves decision making by enterprise owners, managers and employees (Sahab, Rose & Osman, Ray, 2015; and Dillon & Morris, 2018b). This study set out with the rationale for the study to determine whether the adoption of EAA within SMEs could bring a successive change in supply chain

management, whilst other variables such as; internal factors, external factors and perceived attitudes towards the adoption of EAA are tested.

1.3 Problem Statement

The adoption of EAA in SMEs is not always a successful operation due to internal and external constraints such as challenges for participatory design; integrated performance and mechanisms; measurement systems; and technological ignorance (Giovannoni & Maraghini, 2013; Grigoriu, 2014; Faircloth, 2014; and Arbesman, 2015). As SMEs establish new product development and service offerings, they face challenges in SCM based on the size and consequential low economic power (Ketteni, Mamuneas & Stengos, 2011; Khalifa, 2016; and Schwab, 2016). SMEs also encounter difficulties and complications within business cycle on recession and depression parallel with the adoption of EAA for creating competitive benefit in SCM (Callaghan, 2013; Khalifa, 2016; and McPeak, 2018).

Any insufficiencies in the internal and external factors will make the adoption of EAA more of a difficult encounter (Sherman, 2018; Hawks, 2019; and Jessee, 2019). External forces like corporate governance accountability and competition lead to tight linkages with SMEs partners (Trinh-Phuong *et al.,* 2012; and Weber, Geneste & Connell, 2015). The problem is compounded by internal factors such as owner's and worker's characteristics, Enterprise Resources (ER), Information System Components (ISC) and employee competencies that tend to influence the adoption for EAA for SCM in SMEs (Suhadak& Mawardi, 2017; and Sherman, 2018). However, there has been little discussion about the adoption of EAA for SCM in SMEs and the factors influencing adoption.

Previous work has only focused on; enterprise performance, gaps in the organisational structure and reporting channels whereas the underlying causes of the gap between the adoption of EAA and SCM are lacking (Mathaisel, 2013; Iyamu & Mphahlele, 2014; and Hazen, Kung, Cegielski & Jones-Farmer, 2014). The researcher examines the internal and external factors, and provides guidelines for the adoption of EAA in South Africa (Ghobakhloo, Sabouri & Hong, 2011; Gujarat, 2017; Suhadak & Mawardi, 2017; Riezebos, 2017; and Sherman, 2018). The problem is that, factors influencing the

adoption of EAA for SCM by SMEs remain unexplored from the South African perspective. The research gap, therefore, is identified as lack of knowledge on the internal and external factors influencing the adoption of EAA for SCM in SMEs.

1.4 Aim of the Study

The aim of this study is to investigate influence of both internal factors (such as Owners' Characteristics, Enterprise Resources, Information System Components, Employees' Competencies) and external factors (such as complex legal and regulatory constraints; external financing; low technological capacity; and relative advantage) on the adoption of EAA for SCM in the SMEs.

1.5 Objectives of the Study

The research objectives are distinct driving force in all aspects of the methodology, which include instrument design, data collection, analysis and ultimately the recommendations for future studies (Grigoriu, 2014; Lyons, 2017; and Muhamad, 2018). Consequently, the objectives of the study are as follows;

- To determine whether internal factors (Owners' Characteristics, Enterprise Resources, Information System Components and Employees' Competencies) influence the perceived attitudes (Alternative User-Base Solutions, low Technological Aversion, vulnerability and stochasticity and resistance to change) influence Perceived Attitudes towards the Actual Adoption of EAA (alternative user-based solutions, low Technological Aversion and resistance to change) for SCM in SMEs;
- To determine whether external factors (viz., complex legal and regulatory constraints, external financing, low technological capacity, relative advantage, systems compatibility and stochasticity and resistance to change) influence Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs; and
- To determine whether Perceived Attitudes influence the Actual Adoption of EAA for SCM in SMEs; and
- To determine whether internal factors influence the Actual Adoption of EAA for SCM in SMEs.
- To determine whether external factors influence the Actual Adoption of EAA for SCM in SMEs.

1.6 Research Hypotheses

A research hypotheses is defined as detailed, precise and thorough proposition or analytical statement about the future outcomes of a scientific research study based on a particular group of a population. Based on research objectives, hypotheses are presented thus:

- H01: There is no relationship between internal factors and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs;
- Ha1: There is a positive relationship between internal factors and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs;
- H02: There is no relationship between external factors and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs;
- Ha2: There is a positive relationship between external factors and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs;
- H03: There is no relationship between Perceived Attitudes and the Actual Adoption of EAA for SCM in SMEs;
- Ha3: There is a positive relationship between Perceived Attitudes and the Actual Adoption of EAA for SCM in SMEs;
- H04: There is no relationship between internal factors and the Actual Adoption of EAA for SCM in SMEs; and
- H04: There is a positive relationship between internal factors and the Actual Adoption of EAA for SCM in SMEs; and
- H05: There is no relationship between external factors and the Actual Adoption of EAA for SCM in SMEs.
- H05: There is a positive relationship between external factors and the Actual Adoption of EAA for SCM in SMEs.

1.7 Literature Review

The literature on internal and external factors influencing the Actual Adoption of EAA for SCM is reviewed.

1.7.1 Theoretical Review on EAA

Through literature review, the researcher generated more interest to investigate the decision to adopt an EAA by using an adapted TAM for analysing both internal and

external factors that influence SMEs operations in SCM as discussed in 1.7.1.1. below. In recent times, there is slight Actual Adoption of EAA for SCM in SMEs (Shilman, 2017). The conceptual research model known as the TAM is discussed below as it serves as general guideline for the study; detailing it an action research (Zentis, 2020). As a result, the following reasons were critical in the adopted research model.

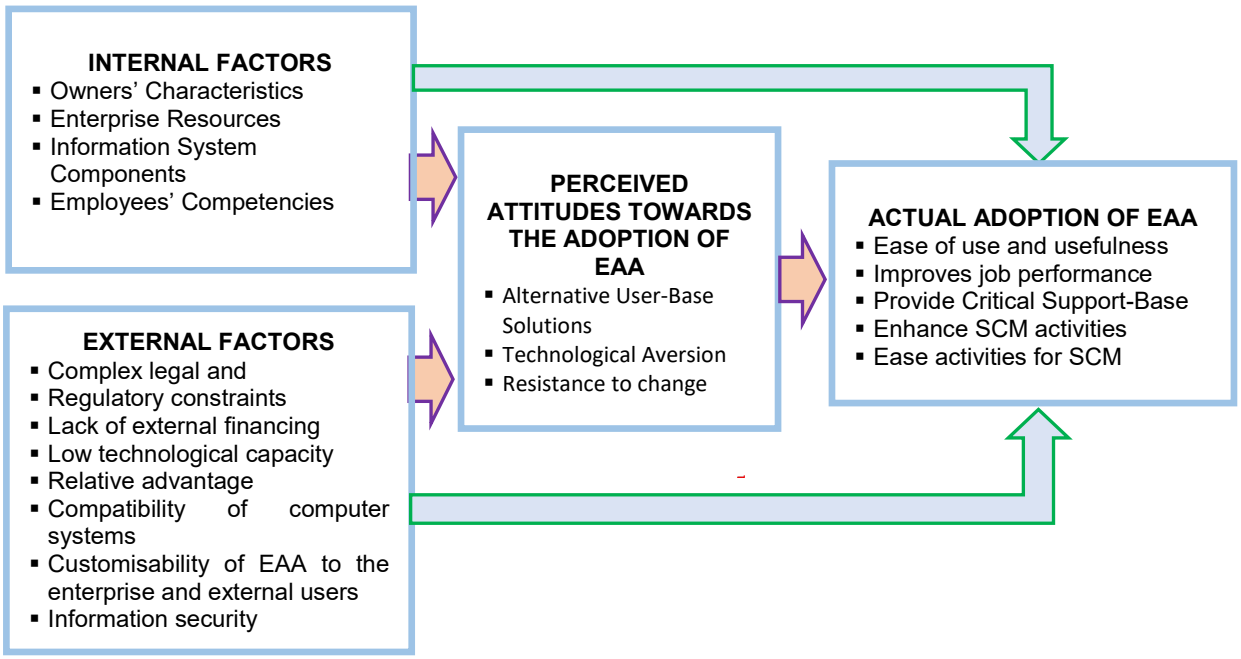


Figure 1.1: The Conceptual Research Model
Source: Author Conceptualisation

Variables such as Owners' Characteristics, Enterprise Resources, Information System Components and Employees' Competencies; and external factors such as complex legal and regulatory constraints, external financing, low technological capacity, relative advantage, how systems compatibility influence the attitude towards adoption, are discussed. Perceived attitude, which includes low Technological Aversion, vulnerability and resistance to change towards the Actual Adoption of EAA that influence actual adoption; how EAA can ease SCM work-flow; and ease of the adoption of EAA through improvement of job performance and enhancement of SCM activities, are also discussed.

1.7.1.1 Theory of Reasoned Action (TRA)

Theoretical models such as TRA denote two elements on attitudes and norms through individual and enterprise expectations (Sternad & Bobek, 2013). TRA is well-defined

as the predictive validity of the Theory of Reasoned Action has been that are examined in the adoption of technologically accepted model such as EAA for SCM (Hackman & Knowlden, 2014). EAA focuses on final output for rational-decision making centred on reasonable and sustainable variables included in that, and Employees' Competencies encountering technological implications (Anderson & Perrin, 2017; and Dillon & Morris, 1996a). Ajzen's Theory of Reasoned Action in the Social Psychology describes TRA as relationships among beliefs, attitudes, norms, intentions and behaviour, based on competency level of labour versus Information System Components such as hardware and software (Ajzen, 1991; Hackman & Knowlden, 2014; and Dillon & Morris, 2018b). The TAM is based on TRA and TAM is the main theoretical model used in this research.

1.7.1.2 Technology Acceptance Model (TAM)

TAM is Information System Components theory used for modelling how end-users makes the conclusions on accepting or using technology (Davis, Bagozzi & Warshaw, 1989). The challenge in SMEs is to identify an EAA system that would serve as a solution in SCM activities. TAM is the basic theory on which this study is grounded as it is generally used to analyse factors influencing the adoption based on the two constructs, namely, ease of use and usefulness (Sternad & Bobek, 2013; and Escobar-Rodriguez & Bartual-Sopena, 2015). TAM was developed by Davis, Bagozzi and Warshaw as a basic theory to analyse individual and enterprise acceptance of new technologies in 1989 (Godoe & Johansen, 2018).

1.7.1.3 Theory of Planned Behaviour (TPB)

TPB employs three user determinants, namely, effort expectancy, social influence and facilitation conditions, to engage in EAA adoption (Hazen *et al.,* 2014). TPB makes assumptions about employee engagement based on certain behavioural patterns, merits and times (Escobar-Rodríguez & Bartual-Sopena, 2015). The Actual Adoption of EAA is based on the TPB using of the managerial roles (Hellriegel, Slocum, Jackson, Staude, Amos, Klopper, Oosthuizen, Perks & Zindiye, 2012; and Erasmus, Ferreira & Groenewald, 2013). In this research, the effort expectancy and facilitation conditions are used in the conceptual research model. But the social behavioural

aspect is included as the study concentrates on the Owners' Characteristic (Coulson-Thomas, 2012).

1.8 Definitions of Terms

Conceptual definitions are described from the research objective for the measurement of the variables, questions were developed containing sets of questions based on the theory.

1.8.1 Internal Factors

Internal factors are described as internal aspects within the enterprise, which includes employees, organisational culture, processes and finances, which measure strength and weakness against external forces (Voges & Pulakanam, 2011; and Jessee, 2019).

1.8.1.1 Owners' Characteristics

Throughout this dissertation, the term Owners' Characteristics is used to refer to entrepreneurial drive that are distinctive traits acquired at birth, which includes passion; independent thinking; optimism; self-confidence, resource and problem solving; tenacity and ability to overcome hardship; and action oriented with vision and focus (Gao & Hafsi, 2015; and Duermyer, 2017).

1.8.1.2 Enterprise Resources (ERs)

Generally, ERs are defined as factors of production, which include human capital formation or employees capital; machinery; equipment; and intellectual competencies that provide SMEs with the means to perform SCM activities (Hersey & Blanchard, 2017).

1.8.1.3 Information System Components (ISCs)

In this research study, ISCs are therefore defined in terms of combinations or collections of different components used for gathering, safe guarding and processing data into providing information knowledge; and digital products for interacting with both internal and external stakeholders (Zwass, 2017; and Jacobson, 2018).

1.8.1.4 Employees' Competencies (ECs)

The term ECs is regarded as a set of analytical skills, negotiating skills and capability skills for the use of elementary desktop and computing skills needed for the adoption of EAA in SCM (Knox & Haupt, 2015; and Tolstoshev, 20117).

1.8.2 External Factors

In general terms, external factors refers to threats and opportunities emerging from both market and macro business environments, with a variety of factors such as competition; customer taste and preferences; and market fluctuations; finance and credit regulatory systems; impacts from severe weather; changes in infrastructure, changing trends; and technological changes (Skoko, Ceric & Hawks, 2019; and Ray, 2019).

1.8.2.1 Complex Legal-Constraints

Throughout this dissertation, the term legal complexity is used to refer to methods to measure and monitor the legal aspects of an entity, governed by legal theories and statutory regulators such as Competition Commission of South Africa, Consumer Board of South Africa and many more, so as to reflect on particular law's complexities to adhere to standard (Ruhl *&* Katz*,* 2015*).*

1.8.2.2 Regulatory Constraints

While a variety of definitions of the term 'regulatory constraints' have been suggested, this study uses the term as forces that every enterprise should compete for in order to execute its strategy, based on period, assets, liquid assets, resources, quality, regulatory compliance, interests of stakeholders, organisational culture and rick tolerance (Spacey, 2019).

1.8.2.3 External Financing

External financing refers the form of bonds, loans and debt financing or to acquire funds business angels and venture capitalists as a way of raising capital rather than retained earnings (Harvey, 2012; and Althuser*,* 2018).

1.8.2.4 Low Technological Capacity

There is no clear definition of Low Technological Capacity, nevertheless, in this study, it refers to an enterprise with low or no funds to cover investment in technological infrastructure and intensity that could be used to adopt EAA (Spacey, 2015; and Del Carpio & Miralles, 2018).

1.8.2.5 Relative Advantage

Relative Advantage is defined as the point-of-return wherein customers take priority of the benefits of a product or service based on its enhanced features and benefits rather than other substitutional product such as the use of computer systems instead of old-school devices such as type writers (Tagged, 2019).

1.8.2.6 Compatibility of Computer Systems

Compatibility of Computer Systems is referred to as the ability of electronic devices and systems to perform functions in proximity of electromechanical devices with zero-defects (Tong, 2019; Sebetci, 2019).

1.8.2.7 System Customisability

In this study, System Customisability is regarded as a process framing the operational activities that includes different system operation for different users in respect of network users; safeguarding data, sorting data for different aspects and automating networks (Barker, 2018).

1.8.2.8 Information Security

Information Security is defined as the theory and practice that provide authorised users the privilege and the right to use computer software and severs on classified information *(Delony, 2019)*.

1.8.3 Perceived Attitudes towards the Adoption of EAA

Perceived Attitude towards the Adoption of EAA in this study is defined as the level of psychological state of willingness, grounded in experience, which indicates a directive or dynamic influence on the person's reaction to all objects and situations to enhance

SCM activities and ultimately the business performance (Davis, 1989; Del Carpio & Miralles, 2018; and Fenech, 2018).

1.8.3.1 Alternative User-Base Solutions

Throughout this study, the term Alternative User-Base Solutions refers to a process whereby Information Technology could be used for searching enterprise solutions through; fieldnames on the system that reveal all tracked documents available in the computer or internet (Thomas, 2011).

1.8.3.2 Technological Aversion

Technological Aversion refers to reluctance in technological usage that includes the use of on-line information on both personal and enterprise data sharing through electronic mechanisms (Law Insider, 2019).

1.8.3.3 Resistance to Change

Resistance to Change in this study is regarded as advanced digital revolution such as EAA with digital transformation's role that provoke denial and fear on new technological innovation aimed at the provision of better results (Merritt, 2019).

1.8.4 Actual Adoption of EAA

Actual Adoption of EAA denotes the ability to use technology related to the migration from old system to a newly-target system associated with the behavioural intention influenced by attitudes within the enterprise, all of which have the chances and opportunity to yield efficient results (Davis, 1989; and Harry et al., 2017). The Actual Adoption is the dependent variable as an accurate measurement that is obtained by measuring perceived attitudes.

1.8.4.1 Job Performance

Job performance is defined as task and contextual performances that involve the expected value from employees over a certain period of time linked with productivity (Hordos, 2018).

1.8.4.2 Critical Support-Base

Critical Support-Base remains a poorly defined term and in this study it is regarded as a software system that detects system errors and prevents any defects and dysfunctionality of both software and hardware systems (Poba-Nzaou, Raymond & Fabi, 2014).

1.8.4.3 Supply Chain Management (SCM) Activities

SCM activities are defined as a combination of methods utilised to integrate internal and external stakeholders so that commodities are manufactured, outsources just-in-time in appropriate qualities and to the specific locations, with the sole purpose of minimising system-wide costs while sustaining service-level requirements (Kaminsky, Simchi-Levi & Simchi-Levi, 2009; and DeCenzo & Robbins, 2014).

1.8.4.4 Ease of Activities

The concept 'Ease of Activities' has come to be used to refer to the degree to which a person identifies critical success factors for ERP implementation sources, which include top management commitment; project management; changes in enterprise culture; data accuracy; user training and education; user involvement; multi-site applications; software vendor support; perceived usefulness; and perceived usefulness (Hwang & Min, 2015).

1.9 Research Methodology

The study was conducted within the area of the Capricorn District Municipality (CDM) in the Limpopo Province of South Africa. CDM includes Blouberg (Bochum) Municipality, Molemole (Dendron) Municipality, Polokwane Municipality and Lepelle-Nkumbi (Lebowakgomo) Municipality (Administrative Divisions of South Africa, 2018).

1.9.1 Research Design

The research design in this study outlines the implementation plan on how the researcher executed the project, whereby a summary on data collection, measurement instruments and data analysis are outlined (Cooper & Schindler, 2012). The quantitative research design is adopted to provide a measure of results and to test the research hypotheses (Anderson, Sweeney, Williams, Camm & Martin, 2013;

Keith, 2014; and Wegner, 2015). Systematic steps are considered as the roadmap for executing the final research output.

1.9.2 Population and Sampling

The population for the study is regarded as an aggregate number of possible respondents targeted for the study that is inhabited in a country with distinc locations such as; cities, towns, townships, rural areas (Collis & Hussey, 2013; Leedy & Ormrod, 2014; and Kumar, 2014). The population of the study is at 1900, from a selection of target groups of business owners or managers within the Capricorn District Municipality. A sample is a fraction of the population from where data are secured and collected as a representative of the whole SMEs (Warren, 2011; Whittaker, 2012; and Small Enterprise Development Agency, 2018a).

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{1900}{1 + 1900(0.05)^2}$$

$$n = \frac{1900}{1 + 1900(0.0025)}$$

$$n = \frac{1900}{1 + 4.75}$$

$$n = \frac{1900}{5.75}$$

$$n = 330$$

Only 20 questionnaires were not fully responded to, and they were deemed for disqualification. Therefore;

$$n = 330 - 20 = 310$$

The sample of study is 310 as calculated in 3.9.1 and it was selected from the population of SMEs owners and managers (Johnson, Turner & Christensen; 2011; Ladner, 2018; and Van Druten, 2019). Stratified random sampling is considered suitable for this research study. Stratification was based on the percentages of the SMEs in each area. In each area, the sample was drawn using random numbers. In the SMEs, enterprise owners/managers were selected.

1.9.3 Data collection

The researcher conducted data collection using structured self-administered questionnaires in a cross-sectional survey.

1.9.4 Data Analysis

Descriptive and inferential statistical methods were used to analyse the data (de Vos, Strydom, Fouche & Delport, 2011; and Collis & Hussey, 2013). The SPSS (version 25) tool was used for producing results on Kolmogorov-Sminorv test for normality, Pearson Correlations, Analysis of Variance (ANOVA) and Pearson Coefficient for testing the hypotheses and Simple Linear Regression for relationships (Omai, 2014; Samuel & Neil, 2016; and Van Druten, 2019).

1.9.5 Reliability and Validity

1.9.5.1 Reliability

Reliability refers to the equivalence in testing reliable outcomes in research projects (Pallant, 2013; and Birley & Moreland, 2014). The Cronbach's Alpha was used to measure reliability at the value of at least 0.7 to indicate the internal consistency of measures (Tavakol & Dennick, 2014).

1.9.5.2 Validity

Validity is whether the research measures are appropriate to estimate the truthfulness of the results without any manipulation of data (Rubin & Babbie, 2013; and Csikszentmihalyi & Larson, 2014). The validity of the research is segmented into two groups, namely, internal validity, which reflects how the research methodology delivers authenticity of the results and external validity, which reflects the extent to which a research measures reality (Dudovskiy, 2016). In addition, content validity, construct validity and face validity were ensured.

Content validity was ensured as all the variables of the research study were obtained from the literature review (Lobiondo-Wood & Haber, 2013). Construct validity was ensured by selecting and testing the relationship between the measurement items and the constructs used (Bagozzi & Yi, 2012). Face validity was ensured by the inclusion of variables as discussed by the scientific community (Bryman, Hirschsohn, Du Toit &

Wagner, 2014; and Shuttleworth, 2015). Internal validity was considered for its accurate procedures and experiment ability to draw out correct assumptions or inferences about the results (Sarniak, 2015).

1.10 Significance of the Study

EAA is increasingly recognised as a success factor in corporate entities and it could bring constructive modifications for SCM in SMEs. This study provides a greater understanding of EAA of the factors influencing the actual adoption of EEA in SCM. The findings could be useful by internal stakeholders (such as enterprise owners, managers and employees) to utilise the benefits of EAA in simplifying the use of various applications. This simplification will allow for using problem-solving methods on Supply Chain; improving Supply Chain performance through better facilities utilisation; having less inventories; and providing quick and accurate information for sourcing and pricing. External stakeholders (such as customers, suppliers, government, creditors, investors and shareholders) will benefit from the internal improvements that EAA provides and the improvement in enterprise networking. The government can consider introducing EAA for SMEs in their training and development programmes.

1.11 Format of the Study

The table below illustrates activities per chapters from one to five that are discussed in a logical order with regard to their introductions, discussions and conclusions.

Table 1.1 Format of the Study

CHAPTERS	CONTENTS
Chapter 1	Chapter 1 outlines orientation and background to the study on factors impacting the Actual Adoption of EAA for SCM within SMEs in Capricorn District Municipality, in the Limpopo Province. Furthermore, the chapter supplies background to and rational for the study, research problem, aim of the study, objectives of the study, research hypotheses, brief literature and theoretical reviews, definitions of terms and significance of the study.
Chapter 2	Chapter 2 focuses on literature review for the study whereby both the theoretical and conceptual framework on factors influencing Actual Adoption of EAA in SCM are discussed. The conceptual model was developed by the researcher and the following variables are discussed; the external and internal factors, together with, attitude towards the adoption of EAA, intention to use EAA, and Actual Adoption of EAA or rejection of EAA.
Chapter 3	Chapter 3 defines the research methodology, which includes study area; Research Design; population of the study; sample and sampling methods; data collection methods and procedures; data presentation and analysis methods; reliability; validity; and ethical considerations.
Chapter 4	Chapter 4 presents data capturing, data analysis and the interpretation of empirical information.
Chapter 5	Chapter 5 covers summaries for findings, conclusions and recommendations derived from the research objectives and hypotheses where possible future studies are highlighted.

Source: Author Conceptualisation

1.12 Conclusion

This introductory chapter provided the background to the study. The aim and objectives of the study, significance of the study and the preliminary research methodology were discussed. Furthermore, it described background to the problem, research problem, problem statement, sub-problems, limitation to the research, purpose of the study, research objectives, research hypotheses, literature review, definition of terms, research methodology, significant of the study and format of the study. In the next chapter, the theoretical framework covering three theories, namely, Diffusion Theory of Innovation, Technology Acceptance Model and Theory of Reasoned Action, are discussed.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The concept of SCM was introduced by Keith Oliver in 1982 at Booz Allen Hamilton, through the public domain, in an interview for *Financial Times* (Badenhorst-Weiss *et al.,* 2018b). Contemporary developments in the field of SCM have led to a renewed interest in EAA. This chapter demonstrates and displays the literature review by covering important aspects such as theoretical framework and conceptual framework of EAA. The conceptual research model includes external factors; internal factors; perceived attitude towards the Actual Adoption of EAA; and the Actual Adoption of EAA for SCM in SMEs. SCMs have significant influence on enterprise operations and, with the inclusion of EAA, SMEs will contribute to improved performance of the South African economy, particularly the Gross Domestic Product (GDP).

2.2 Theoretical Literature Review

2.2.1 Technologically Acceptance Model (TAM)

In this study, during the review of TAM, some of the constructs such as perceived ease of use and perceived usefulness were not used in this study. The aim was to shorten the conceptual research model and to explore other variables such as internal and external factors affecting the adoption of EAA. Using the TAM for analysing the adoption of EAA for SCM in SMEs can improve the low actual adoption (Shilman, 2017). TAM is a theory that is used to analyse the adoption of new technologies by organisations (Escobar-Rodriguez & Bartual-Sopena, 2015). TAM was developed by Davis, Bagozzi and Warshaw in 1989 (Godoe & Johansen, 2018).

TAM focuses on rational decision-making for technological implications that would bring a significant change in SCM (Anderson & Perrin, 2017; and Dillon & Morris, 1996a). For SMEs to be more efficient and effective in SCM, they need to take calculated risk by investing in TAM that will bring positive benefits for the entire enterprise. The intended actual adoption of new technology is influenced by the ease-of-use and usefulness of EAA for SCM (Schnädelbach, 2010; Travis, 2017; and Leong *et al.,* 2012). An implication of this is the possibility that TAM would be efficient in SMEs that are willing to invest more financial resource that allows a roof for learning, implementation and execusion of EAA.

2.2.2 Theory of Reasoned Action (TRA)

Ajzen's Theory of Reasoned Action in Social Psychology describes the relationships between beliefs, attitudes, norms, intentions and behaviour based on competency level of labour, versus Enterprise Resources such as hardware and software systems (Hackman & Knowlden, 2014; and Dillon & Morris, 2018b). TRA is a good illustration of EAA actual adoption as it reveals the decisions required in the choice of the business as a prerequisite for the actual adoption (Mutopo, 2016; Zayra, 2016; and Thomas & Tagler, 2019). TRA validates the adoption of EAA by prioritizing the behavioural patterns of employees and their general knowledge on IT (Hackman & Knowlden, 2014; Sternad & Bobek, 2013; and Escobar-Rodríguez & Bartual-Sopena, 2015). TRA suggests that employees' behavioural patterns could be monitored and directed towards the Actual Adoption of EAA for SCM. TRA states that behavioural

measures are speculations on the intentions of acceptance or rejection technology (Camadan, Reisoglu, Ursavas & Mcilroy, 2018; LaMorte, 2018; and Hagger, 2019). TRA was synthesised using the same method that was detailed for the adoption of EAA, using the following constructs namely; ease of use of activities and their general knowledge components of IT.

2.2.3 Theory of Planned Behaviour (TPB)

TPB it is ment to produce useful information for effective communication approaches that involves attitudes, behavioural intention, subjective norms, social norms, perceived power and perceived behavioural control for the adoption of EAA for SCM in SMEs (Alzen, 1991). Moreover, it is defined as means to produce useful information for effective communication approaches that involves insourcing, processing and outsourcing activities in SCM (Silverman & Lim, 2016). TPB explains three user determinants, namely, effort expectancy, social influence and facilitation conditions to engage in EAA adoption (Hazen *et al.,* 2014). It emphasises conceptual Actual Adoption of EAA based on thorough application of managerial roles, such as planning, organising, leading and controlling (Hellriegel, Slocum, Jackson, Staude, Amos, Klopper, Oosthuizen, Perks & Zindiye, 2012).

Thomas and Tagler (2019) show how, in the past, research using TPB was mainly concerned with changing attitudes and subjective norms of employees rather than actual adoption (Dippel *et al.,* 2017). The extended TPB model includes interpersonal and situational variables that may have an influence on the attitude towards intention to use for SCM in SMEs (Hackman & Knowlden, 2014; and Pesquisa, 2018). The theory includes behavioural achievement that relies on motivation and ability, which are differentiated with three beliefs, namely, behavioural, normative and control for internal and external systems used in SCM. This shows a need to understand the motivational aspects of the Owners' Characteristics (O'Kelly, 2016; Halabisky, 2017; and Forsdike *et al*., 2018). TPB was synthesised using the same method that was detailed for the adoption of EAA, where; attitudes, behavioural intention, subjective norms, social norms, perceived power and perceived behaviour were scrutunised.

2.2.4 Diffusion Theory of innovation

A basic theory also underlying this research is the Diffusion Theory of Innovation (DTI). The DTI was originally developed by E.M. Rogers in 1962 for communication in social systems by describing how new ideas spread in an organization (Dearing, 2009, Mulder, 2012; Chatterjee, 2017; Rehman, Majumdar & Krishna 2017; and LaMorte, 2018). The theory's origin is in communication model maintaining how new inventions in technological standards evolves as time moves in a positive direction in-line with socio-demographic factors that maintain drive and diffuses through a specific population or social system (Rehman *et al.,* 2017).

DTI can use as a conceptual model explaining the diffusion of technological innovative systems (Green, 2014; and MacVaugh, 2019). As a results, two essential elements are involved in the DTI; (a) the innovation part that needs to modify an appropriate change or upgrade in SCM that is spreading towards SME development (b) and vectors of communication diffusion that need to be at hand for agile information dessermination (Ingram 2017). Five constructs were adopted in the Diffusion Theory of Innovation, namely, relative advantage, compatibility, complexity, triability and observability, all of which encourage the adoption of new processes and ideas. These construct were used to develop questions on the Perceived Attitudes towards Adoption of EAA for the questionnaire.

Relative advantages materialise when customers prefer on-line purchases on its enhanced features and benefits rather than engaging in door-to-door purchases (Tagged, 2019). Potential adopters, therefore, evaluate an innovation on its relative advantage (i.e., the perceived efficiencies gained by the innovation relative to current tools or procedures), its compatibility with the pre-existing system, complexity or difficulty to learn, its triability or testability, its potential for reinvention (using the tool for initially unintended purposes), and its observed effects (Vejlgaard, 2018; and Baker et al., 2019). To date various theories have been reviewed and introduced to measure DTI in light of EAA as a key factor for SMEs adoption.

2.3. Defining EAA for Supply Chains

2.3.1 Introduction

EAA combines multiple enterprise functions across business functional departments for SCM (Bennett, 2017; Markgraf, 2018; and Sherman, 2018). EAA is capable of production efficiency in SCM activities (Barros & Julio, 2011; and Hersey, 2015). Each time an enterprise application is being introduced into an existing system, the business processes are linked via the EAA (Shamsuzzoha & Helo, 2012; and Escobar-Rodriguez & Bartual-Sopena, 2015). As such, EAA enhances activities by automating the SCM activities within and beyond the market development through modular product architecture and information management (Fahy & Jobber, 2012; Shamsuzzoha & Helo, 2012; and De Valence, 2017).

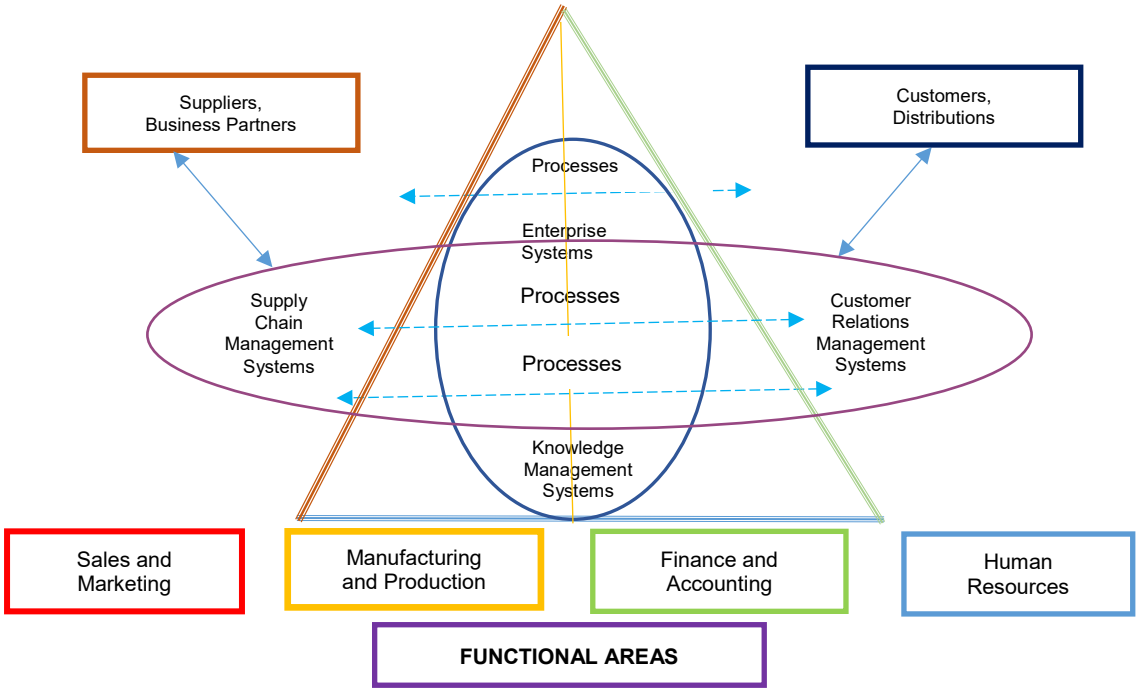


Figure 2.1 Enterprise Application Architecture
Source: Laudon & Laudon, 2018

EAA includes diagrams, documents and models that describe the logical flow of the enterprise functions, capabilities, processes; human capital formation; information resources; business systems; software applications; computing capabilities; information exchange; and communications infrastructure within the enterprise processes (Kelly, 2018). An investigation of EAA on actual adoption for SCM has

shown that all functional departments need to be incorporated in the system with the enterprise (Kuhn, Galloway & Collins-Williams, 2016; and Asetpartners, 2018). It is overbearing for SMEs to structure EAA that will impact on enterprise structure for SCM.

2.3.2 Suppliers and business partners

The enterprise interactions with suppliers includes working hand-in-hand with other contractors for the provision of innovative solutions in a sustainable and ethical environment by exploiting, operating and take advantage of available resources and adopting EAA in SCM (Vogt, 2017; MTN Group, 2019; and Vodafone, 2019). Digital trends are impacting the suppliers' expectations with complex and constant changes, which requires them to collaborate in the SCM environment (Shelat, 2016; and Van der Meulen, 2018). Enterprises are operating in a digital-age with hierarchies and different elements of administrative protocols and algorithms for SCM with quality assurance, timely delivery and adherence to responsible business practice (Chadwick, 2018; and Ingram, 2018).

A number of functions for interfaces with supplier should include contract management; customer service systems; data gathering regarding customer requirements and trends in the market; customer history tracking; order entry; decision-support for campaigns; and market segmentation (Guimarães, 2012; Badenhorst-Weiss *et al.,* 2016a; and Naughter, 2017). EAA relies on logistical arrangements between the suppliers and the SMEs for collaboration, administration protocols and contract management with service systems (Ballard & Barker; 2016; Naughter, 2017; Mulder, 2019; and Coster, 2019).

By aligning innovation with agility and implementing statutory framework that defines all roles, responsibilities and relationships involved in the program management and IT processes, could give SMEs a competitive advantage in SCM (Asetpartners, 2018). The strategic component for suppliers includes decisions is the number, size and location of warehouses and the selection of SCM partners (Ingram, 2018). For a successful business partners' relationship, it would be necessary to develop partners in a business functions by creating a project that contributes to business value and

encourage flexibility in EAA (Hickey, 2015). SMEs should make room for accelerated processes and faster development linked to the Actual Adoption of EAA for SCM.

2.3.3 Processes and Enterprise Systems

Processing and enterprise systems link are common challenges characterised by processes and algorithms in the Actual Adoption of EAA. Enterprise system features enable SMEs to experience cost-reducing strategies such as reduction in manual record keeping, agile customers and suppliers tracking system, increased efficiency and effectiveness (McDonald; 2018). Improved customer service depends on resourced operations that are designed to enhance customer retention and build brand equity through the Actual Adoption of EAA (Sambartolo, 2015; Hamid, 2016; and Dillon & Morris, 2018b). Enterprise system features enable SMEs to experience cost-reducing strategies such as reduction in manual record keeping; agile customers and suppliers tracking system; and increased efficiency and effectiveness (Ogrinja, 2013; and Nordmeyer, 2019).

The EAA includes three steps to digital SCM, namely, confirming the organisation's digital vision and Supply Chain's role; alignment of SCM operating model to the digital vision; and prioritising digital technology investments (Coté, 2016; and Van der Meulen, 2018). SCM strategy includes a demand-driven operating model that integrates customers, processes and technology, for a better EAA system (Oracle, 2018; and Gemalto, 2018). The market and macro-environment pressure brings changes in standards and regulations, thus leading to change or upgrades in processes (Guimarães & Souza, 2012; Hickey, 2015; and Writing, 2017).

Digital business services use different connectivity for bridging the gap between strategic, operational and functional strategies occurring in SCM (Sinha *et al.,* 2015; and Altexsoft, 2018). Customer intimacy is determined by factors such as; experience, fulfilment desired products, accessibility for products and possession of valued items as requested that carry a certain impact on processing programs (Asmundson, 2017; and Badenhorst-Weiss *et al.,* 2018b). Customer's value could be identified through vital elements such as; conformance to the specific requirements, product selection, value-added services, price and branding, relationship and experiences that would

impact the processing (Barros & Julio, 2011; and Badenhorst-Weiss *et al.*, 2016a). Although there are limitations to SMEs towards the Actual Adoption of EAA for SCM, other factors such as adherence to technological standards could be used to keep track of sales, customer demand and retention, building brand-equity with value-added services in progression with processes and enterprise systems.

2.3.4 Customers and Distributors

A primary concern for customers and distribution is in the SCM activities that provide agile services just-in-time (Rouse, 2018b; and Crain, 2018). Customer and distribution links results from feedback mechanism in data management, distribution and network optimisation with Knowledge Management Systems that permits SMEs to share and communicate decisions between demand and supply interaction (Aveva, 2019). In the traditional approach, some SMEs consider distribution as a physical routes that a product flow from the supplier to customers, and sellers could use member of criteria such as; complexity of technical requirements in EAA, lifespan and price of the software and hardware, service requirements an turnover generated to determine their distribution cost-efficiency (Vogt, 2017).

Distribution and logistics could be hindered by unforeseen circumstances such delays in shipping that can leave a lasting impact on customers and directly affecting Customer Relationship Management System (CRMS) (Saha, 2018). Electronic interchange includes the exchange of business transaction between multiple business and customers by make use of internet interfaces for transmitting data and information from business-to-business, business-to-customer, consumer-to-consumer or consumer-to-business (Rouse, 2018c). The relevance of customer and distribution link in EAA could depends on technical requirements per SMEs for a aligning it with customers on the website or internet sources for easy access for processing transactions on-line.

2.3.5 Supply Chain Management System (SCMS)

Much of the current literature on SCMs pays particular attention to ever-increasing competition and service delivery demands are forcing SMEs to revisit the operational efficiencies of their Supply Chains facing barriers to competition (Sewdass, 2012;

Asmundson, 2017; and Ticlo, 2018). The discipline of SCMS has encouraged considerable research interest in recent years (Susan *et al.,* 2012). This is evident in empirical articles that some large firms they progressively expanded their business and upgraded their service offering over periods of 8 to 20 years as they benefited on EAA investments (Perry & Towers, 2013). The SCMs should be maintainable and sufficiently responsive to support the SMES informational requirements with practical and open knowledge sharing process (Guimarães & Souza, 2012). Internal and external factors compel SMES to be more responsive based on changing and unpredictable business environments (Sharma, 2015a).

At present, SMEs are facing growing pressure on improving logistic performance as a number of factors can cause delays in the SCMS (Wisner *et al.,* 2012). EAA is organised on the life sequence of the transformational processes that portrays the flow of phases necessary to initiate, sustain and continuously refine SMEs based upon lean principles and systems engineering methods with other SC partners (Flower, 2018c). Factors found to be influencing SCMS have been explored in several studies, which includes that a broader SCMS framework is coupled with risk analysis and management of product architectures for SCMS design, testing and implementation (Pashaei & Olhager, 2015).

Integrated systems involve human subjectivity, uncertain mathematical framework for integrating imprecision and ambiguity into the models for SCMS (Kahraman, Kaya & Çevikcan, 2011). Despite the fact that there are formal processes that need to be aligned with EAA, SCMs depend on other functional departments and they have better interactions with operational efficiencies being able to face barriers to competition by applying on-hand mathematical frameworks (Vogt, 2017). The most apparent encounter to emerge from SCM is that SCM activities such as insourcing, processing and outsourcing should be linked with enterprise functional departments for an equitable Actual Adoption of EAA.

2.3.6 Customer Relationship Management Systems (CRMSs)

CRMSs it is known as collective name for a management strategy with many individual sub-strategies, which are implemented through diverse processes, technologies and approaches (Badenhorst-Weiss *et al.*, 2016a). CRMSs help SMEs to seal the SCM transactions faster while consolidating the CRMSs (Sinha, Zande & Smith, 2015). In principle, CRMSs help SMEs to recognise valued-customers on an automated and tracking from customer database, firstly by partitioning their demands and requirements (Lin, 2016; and Chamber of Commerce of Metropolitan Montreal, 2018). CRMSs ultimately help businesses to grow by building a relationship with their customers that, in turn, creates loyalty and customer remembrance engineered for SCMS and long-term relationships (Cognite, 2018).

The evaluation of customer retention is waved on monetary value invested in the EAA and software technology that provide accurate results about customer habits and purchasing patterns (Waskito, 2018). The positive side on implementing EAA for CRM system is that there is very less need for paper and manual work, which requires lesser staff to manage and lesser resources to deal with (Vogt, 2017; and Juneja, 2018). There is an important relationship between CRM and SCM that depend on factors such as demand management, creating customer value, depended demand and capacity management (Badenhorst-Weiss *et al.,* 2016). There is, therefore, a definite need for techniques for solving CRM challenges are computationally demanding and not neglecting their purchasing patterns and SMEs capacity management.

2.3.7 Knowledge Management Systems (KMS)

The nature of KMS has been addressed in small-scale investigations in EAA and, as such, in hiring, prioritising digital dexterity, a combination of analogue and digital skills and traits, over pure technical know-how, of which is a careful process, is vital in SCM (Van der Meulen, 2018; and Merritt, 2019). KMS involvement could be considered as investment in SCM and EAA could be considered for such invention (Reyes *et al.,* 2015). Human capital formation in SCM provide employees with extraordinary experience and with the Actual Adoption of EAA with low scientific knowledge (Azoulay, Jones, Kim & Miranda, 2018). Knowledge-intensive task for SMEs is to use comprehensive IT applications like EAA (Ardley, Moss & Taylor, 2016). Theoretical

basis for understanding learning as a social process and argue “learning is defined not only as the acquisition of knowledge but also the acquisition of identity by having a deep knowledge about the systems processes in the Actual Adoption of EAA (Chen, 2017; and Smith & Barrett, 2016). Successful SMEs have the most inspirational ideas that needs to be natured with relevant KMS with a perfect identification of window of an opportunity (Jenkin, 2016; and Tumenta, 2016). Knowledge-intensive task for SMEs use comprehensive IT applications like EAA and sharing with extended teams (Sinha *et al.,* 2015). KMS could be linked with both quantitative and qualitative approaches that leads to improvement in SCM in production forecasting (Chamber of Commerce of Metropolitan Montreal, 2018).

It could be a difficult encounter for some SMEs to cope with larger business organisations as they have EAA in place and with formal systems making working relationships difficult as they have competitive advantage on on-going activities linked to the KMS, such as clarifying employees’ responsibilities, job descriptions, organograms and lines of authorities (Nieman, 2013). Despite the exploratory nature of KMS the key success factor would be to consider the digital dexterity, distribution of information from internal and external perspective by clarifying employees’ responsibilities, job descriptions and following all organograms.

2.3.8 Sales and Marketing

This section outlines how sales and marketing activities are changing and upgrading EAA could compel the SMEs to design a dynamic electronic link for a changing marketplace (Chadwick, 2018). An EAA is developed to collect information such as sales accumulation versus costs incurred across the SMEs’ different geographical locations and by categorising total sales comprised of cash and credit sales (Ingram, 2018). EAA assist managers to focus on the organisation's information and IT systems by analysing the SMEs challenges on sales and market related activities (Beal, 2018a). EAA could be used within the SMEs at an operational level between sales and marketing, manufacturing and production, finance and accounting and human resource for sharing information (Gemalto, 2018).

SCM involves using a formal planning process that involves historical data on dependent demand and independent demand (Writing, 2017; and Badenhorst-Weiss *et al.,* 2018b). For the correct use of EAA, SMEs could maintain their sales and marketing records on daily, weekly, quarterly and annual basis (Cognite, 2018; and Waskito, 2018). In-house communication across the SMEs to yield common and mutual understanding for internal forces such as strength and weaknesses and external forces on opportunities and threats (Callaghan, 2013; Herman & Stefanescu, 2017; and Kozicki, 2017). Moreover, more of sales and marketing activities should be incorporated in EAA for data management, mining and processing with ease in financial and marketing departments.

2.3.9 Manufacturing and Production

Current developments in the field of IT have led to a renewed interest in manufacturing and production by using software applications for SCM that are ready-made package usually targeted for dealing with certain set of tasks (Markgraf, 2018). Operational manager's general viewpoint toward inventory levels is adopt EAA to keep a constant rate of productivity and to ensure that the SMEs' Financial Resources (FRs) are not being wastefully capitalised in excess resources (Gitman, 2015; and Rupeika-Apoga & Danovi, 2015). EAA is a model that represents two purposes: (a) it focuses on the employee as a sub-system, with specific algorithms executed by employee with the use of different, tools, machinery and equipment; and (b) it focuses on technical sub-algorithms aimed at managing, maintaining knowledge, skills and abilities for administrative proposes (Ferreira *et al.,* 2013; and Ray, 2017). In spite of these EAA occurrences, it is evident that manufacturing and production should at least have automate algorithms, intensive knowledge and technical skills, so as to capitalised in cost savings and not disregard economic factors such as inflation, recession and interest rates.

2.3.10 Finance and Accounting

Accounting Information System Components in modem economy has brought simplicity in analysing the main duties and responsibilities for Accountants and Financial professionals by adopting modern technology such as EAA (Trigo & Belfo, 2013; and Wayner, 2018). The challenge is towards the Actual Adoption of EAA for

SCM that would bring financial clarification on creditors and suppliers' records in SCM (Shilman, 2017; and Saito *et al.,* 2017). As a result, the software application systems needs to support data preservation from the time at which a transaction occurred (Eberechukwu & Chukwuma, 2016; Shelat, 2016; and Shefer, 2018). A well-structured EAA would be able to include multiple activities such as raw-material ordering and processing, planning for material purchasing, inventory control, distribution, accounting, marketing, finance, direct and indirect labour assessments (Kharytonov, 2012; Brunello, 2013; and Beal, 2018d). These factors influence the use of EAA to achieve optimal performance in SCM. Convenient package-software applications are for mass-customised products and thus by design disregard the specific requirements of certain SMEs (Portugal, 2016; McLaughlin, 2016; and Igriany, 2018).

EAA is a fundamental-intellectual property for SMEs based on the contexts and emphasise for description of different conceptual models developed and managed for reasonable SMEs system that include Information System Components and integration phases for developing optimal solutions for SCM (Filho & Aquino Júnior, 2015; and Banaeianjahromi & Smolander, 2016). Many theoretical models have been developed with the sole purpose of fulfilling demand forecast on SMEs alliances for better SCM in SMEs and corporations (Hazen *et al.,* 2014; Iyamu & Mphahlele, 2014; and Ingram, 2018). Overall, there seems to be some evidence to indicate that EAA depends upon the conceptual framework from authors' conceptualisation that includes Owners' Characteristics, ER, ISCs and EC competencies.

2.4 Small And Medium Enterprises (SMES)

The SMEs are regarded as the pillar of economic development and growth in the South African economy. Small and Medium Enterprises are the primary focus in this research study. Based on their economic and monetary contribution to the economy, the researcher's optimism was triggered to include SMEs rather than micro enterprises, private and public enterprises.

2.4.1 Defining Small and Medium Enterprises

This concept on defining SMEs have recently been challenged by the adoption of EAA studies demonstrating ways they are defined in the South African context, in

quantitative and qualitative approaches by the National Small Enterprise Act, 1996 (Act No. 102 of 1996), National Enterprise Amendment Act, 2003 (Act No. 26 of 2003) and the National Small Enterprises Act, 2004 (Act No. 29 of 2004) (Small Business Development, 2019).

Table 2.1 Industrial classification of SMMEs in South Africa

Sectors or Sub-Sectors in Accordance with the Standard Industrial Classification	Size or Class for Enterprise	Total Full-Time Equivalent of Paid Employees	Total Annual Turnover
Agriculture	Medium	51 – 250	≤ 35,0 Million
	Small	11 – 50	≤ 17,0 Million
	Micro	0 – 10	≤ 7,0 Million
Mining and Quarrying	Medium	51 – 250	≤ 210,0 Million
	Small	11 – 50	≤ 50, 0 Million
	Micro	0 – 10	≤ 15,0 Million
Manufacturing	Medium	51 – 250	≤ 170,0 Million
	Small	11 – 50	≤ 50,0 Million
	Micro	0 – 10	≤ 10,0 Million
Electricity, Gas and Water	Medium	51 – 250	≤ 180,0 Million
	Small	11 – 50	≤ 60,0 Million
	Micro	0 – 10	≤ 10,0 Million
Construction	Medium	51 – 250	≤ 170,0 Million
	Small	11 – 50	≤ 75,0 Million
	Micro	0 – 10	≤ 10,0 Million
Retail, Motor Trade and Repair Services	Medium	51 – 250	≤ 80.0 Million
	Small	11 – 50	≤25,0 Million
	Micro	0 – 10	≤ 7,5 Million
Wholesale	Medium	51 – 250	≤ 220,0 Million
	Small	11 – 50	≤ 80,0 Million
	Micro	0 – 10	≤ 20,0 Million
Catering, Accommodation and other Trade	Medium	51 – 250	≤ 40,0 Million
	Small	11 – 50	≤ 15,0 Million
	Micro	0 – 10	≤ 5,0 Million
Transport, Storage and Communications	Medium	51 – 250	≤ 140,0 Million
	Small	11 – 50	≤ 45,0 Million
	Micro	0 – 10	≤ 7,5 Million
Finance and Business Services	Medium	51 – 250	≤ 85,0 Million
	Small	11 – 50	≤ 35,0 Million
	Micro	0 – 10	≤ 7,5 Million
Community, Social and Personal Services	Medium	51 – 250	≤ 70,0 Million
	Small	11 – 50	≤ 22,0 Million
	Micro	0 – 10	≤ 5,0 Million

Source: Department of Small Business Development, 2019

Furtheremore, they are defined as enterprises that are categorised by number of variables that includes; accumulation of revenue, assets and Number of employees with the sole intention of maximising profit (Amine, 2018). Qualitatively, SME are defined as cooperative enterprises and non-governmental organisations that have

separate and distinct characters that are managed by one proprietor or more individuals, which includes its extended branches or subsidiaries (Department of Small Business Development, 2019). Quantitatively, SMEs are classified in the table below according to total full-time equivalent of paid employees and total annual turnover in the different industry types (Department of Small Business Development, 2019). Furtheremore, SMEs are are defined as entities that preserve their enterprise class and size, revenue, assets and number of employees with a primary objective for maximising profit (Amine, 2018).

The categorisation is more advanced with grouped sectors as; agriculture, mining and quarrying, manufacturing, electricity, gas and water, construction; retail, motor trade and repair services; wholesales; catering, accommodation and other trade; transport, storage and communications; finance and business services; and community, social and personal services (Department of Small Business Development, 2019). SMEs from all sectors of the economy play a significant role in tax contribution, which later gets distributed through State organs and Corporate Social Responsibility.

2.4.2 Contribution of SMEs to the South African Economy

SMEs contribution are significantly recognised as GDP growth, which is measured through contribution towards employment, wealth formation, poverty alleviation and innovation conception. The contributions by SMEs categorised in to three spheres as; economic, industrial and firm based benefits with limited control over the market and macro business environment (Rees & Porter, 2015; Schwab, 2016; Singh, 2018). At least five contributions are discussed in terms of gross domestic product (GDP), employment, wealth formation, poverty alleviation and innovation conception;

2.4.2.1 Gross Domestic Product (GDP) Contribution

In economics viewpoint GDP includes variables such as; consumption, government, investment expenditures and net exports that happens within the boundaries of the South African economy during a specified period of time, usually a year. GDP is regarded as an instrument for measuring the aggregate and monetary value of final commodities and services produced within the boundaries of a country at a given period of time (Callen, 2020). SMEs are regarded as fundamental contributing factors

to GDP in the South African economy, as documented in the National Development Plan (NDP), and is expected to contribute 60-80% of the GDP by the financial year 2030 (Kamleitner, Korunka & Kirchler, 2012; and Vuba, 2019). Copmpetition amonst SMEs enhance completion in the industry were enterprises improve both their production, service offerings and practicing the total quality management to avoid in product liability leading to economic growth in GDP(Van Aardt, Bezuidenhout, 2014). The contributions include contributions to employment and equitable distribution of income (Marais, 2018; and Liedtke, 2019). SMEs stimulate the economy during business cycles such as boom, peak, recession, depression and recovery (Susman, 2017).

Based on a study by Thulo (2019), SMEs' contribution to the economy is affected by little government support for funding, market access, regulations and growth strategies. It contributes thirty-six percent to the GDP in South African economy (Smit, 2017). SMEs contribute by paying tax that stimulates the economy through equitable distribution of income (Nkosi, 2019). Entrepreneurs who acquired work experience from previous employers could stimulate the economy through applying those skills for SCM (Saito, Sakurazawa & Nakamura 2017; and Marks, 2018). Government initiatives in business support leads to expansions in market competition, improvement in product and service offerings and economic opportunities assisting in meeting demand and need of customers (Pinho & Sampaio de Sá, 2014). SME survival would make a positive contribution to the South African economy.

2.4.2.2 Contribution towards Employment

Employment could be referred to as an agreement between the employer and employees where the employees are expected to render their services in a safe work place covered under Labour Law Act, which includes health and safety, remuneration packages and other fringe benefits, whilst the employer set the rules and regulation that are accepted by the law to administrate the employees. The South African economy suffers low employment rate due to under-skilled population despite available job vacancies (Vuba, 2019). SMEs contribute towards employment at 15.4% to the South African economy (Small Enterprise Development Agency, 2019). The Actual Adoption of EAA could lead to scarce skills recruitment to manage systems

configurations in SCM (Ronny, 2017). SMEs plays a significant role in the economic stimulation through employment (Weber, Geneste & Connell, 2015). In a study by Ansara (2019), approximately 98% of registered SMMEs contribute less than 28% towards employment with the government aspirations to increase it to 90% in 2030 (Ansara *et al.,* 2019). Employment in SMEs is motivated by other socio-demographic factors like age, educational background, and the type of the sector (Blackburn, Hart & Wainwright, 2013). The livelihood of SMEs are based on financial breakthrough as an indication toward business growth, which is evident in some entrepreneurs' lifestyle expenditures (Weber, Geneste& Connell, 2015; and Kuhn, *et al.,* 2016). In practice, a positive relationship between the employer and employee is regarded as a point of mutual interest and impact on efficiency and effectiveness that yields productivity.

2.4.2.3 Contribution to Wealth Formation

Wealth could be regarded as a financial breakthrough for the enterprise as evident in bank and financial statements and, to some extent, in investments and enterprise expansion. A growing turnover contributes towards the increased profitability of enterprises that stimulates wealth for the economy (Blackburn *et al.,* 2013). Weber *at al.,* (2015) maintain that enterprise growth is determined by the level of growth in sales, market share, assets accumulation, profitability and number of employees. In some instances, entrepreneurs find themselves in a sacrifice position wherein they use their personal savings for the business (Sjögrén, Puumalainen & Syrjä, 2011). The degree of an enterprise's success is determined by the level of services offered to both internal and external stakeholders (Ardley, Moss & Taylor, 2016).

Effective communication methods could advance enterprise growth through technological advancements (Kuhn *et al.,* 2016). Sun (2011) establishes a creativity, innovation and entrepreneurship model (CIM) that comprises project, process, problem, principle, practice, performance and presentations that could assist SMEs to accumulate wealth. Wealth creation in SMEs is determined by the level of enterprise knowledge, managerial and leadership styles applied to develop long-term relationships with employees.

2.4.2.4 Poverty Alleviation

Poverty alleviation could be regarded as an act of practising economic principle through full employment. SMEs play a significant role in providing employment (Ardley, *et al.,* 2016). Tax compliance from SMEs perspective leads to better distribution of income within the economy (Ardley *et al.,* 2016). A financial growth in SMEs lead to poverty alleviation within the economy wherein people are employed and able to cater for their physiological needs for daily survival (Kuhn *et al.,* 2016). Poverty could be eradicated through SMEs' contribution towards employment. On the other hand, government initiatives through enterprise development could lead to economic boom that leads to better life for all through employment. EAA adoption will require an IT personnel with credentials that meet the job specification, which is regarded as part of employment relief for members of the society.

2.4.2.5 Innovation Conception

Innovation is defined as modification to processes by adopting technological systems that bring a productive output with ease (Sarri, Bakouros & Petridou, 2010; and Sun, 2011). In a study by Blackburn *et al.*(2013), it was found that it is critical for SMEs to develop a for a successful adoption of EAA in SCM: SMEs as prospectors play an important role as major job suppliers, innovators and sources of growth in free market-economies with long-term aspirations on modernisation of systems (Weber *et al.,* 2011). An objective is to develop a favourable innovative environment based on setting up innovation-hub and centre for SMEs; and involving governments' enterprise developments that could produce maximum results for SMEs (Pinho & Sampaio de Sá, 2014).

As defined in Table 2.1 for industrial classification of SMMEs in South Africa, SMEs stand a chance for differentiating themselves in terms of innovative orientation for opportunities and success factor (Weber *et al.,* 2015). Innovation encourages new approaches toward the adoption of EAA. Entrepreneurial interest stimulates innovation on EAA adoption that requires strategic orientations in regardless of Technological Aversion discussed in 2.6.2 (Sjögrén *et al.,* 2011). In some instances, innovation categories include comparing typologies in EAA that could bring future

growth in SCM (Catley & Hamilton, 1998). Innovation conception in SMEs depends on open platforms that encourage calculated risk-taking linked with monetary value.

2.5.3 EAA Challenges Faced by SMEs

2.5.3.1 Lack of Financial Sustainability for the Actual Adoption of EAA

The ever increasing problem faced by the SMEs is based on slow growth due to lack of capital for purchasing the required hardware and software for a possible Actual Adoption of EAA (Little, 2010; Mustafa *et al.,* 2016; Sherman, 2018; Ticlo*,* 2018; and Liedtke, 2019). Nevertheless, not every SME has all ISC in their possession to adopt EAA. The other challenge is in relation to employees' skills, training and development that might be lacking to assist them in exploring the benefits of adopting EAA in SCM (Susman, 2017). SMEs encounter challenges when acquiring finance due to paper work, security on personal property and proper financial records that might be seen as difficult work to engage into (Kraemer-Eis, Botsari, Gvetadze, Lang & Torfs, 2018; and Vuba, 2019).

In this regard, financial matters could be resolved to address the issues surrounding; enterprise interactions with supplier, processes and enterprise systems. The ability to process and interpret large volumes of complex SMEs' information is also a problem (Vaiman *et al.,* 2012). The applications for loans by SMEs involve a number of complex processes such as; production-flow, information sharing, financial transfers, credit worthiness, flexible payment methods, financial risk, leverage and price elasticity of demand (Saha, 2018; and Sahni, 2019**).** Financial approval for Actual Adoption of EAA for SCM documentation on SMEs depend on substantive documentation (Fitzgerald, Brown, Herbert, King & McAulay, 2017).

Work experience is regarded as an important for accessing financial capital (Holzherr, 2013; and Azoulay *et al.,* 2018). Risk is one of the results following entrepreneurs' reluctance to invest in financial markets and institutions (Genever, 2017). In some instances, the major factors that impact South African SMEs from socio-economic issues; include interest and exchange rates, inflation, unemployment, crime, HIV/Aids, change in technological advancements and statutory regulations (Ketteni, Mamuneas & Stengos, 2011; Rehman *et al.,* 2017 Singh, 2018; Chappelow, 2019). Last but not

least the Covid-19 pendemic have impacted the population dynamics in global arena as a major threat to the livelihood for both enterprise' internal and external stakeholders through the loss of lives and businesses that impacted the world business market negatively (Tourish, 2020). In deduction, most SMEs have the challenge of financial constraints that obstruct them from the Actual Adoption of EAA for SCM.

2.5.3.2 Lack of Formal Education for the Actual Adoption of EAA

Lack of education could be regarded as illiterate rate SMEs face challenges, such as, lack of formal education in the use of computer equipment for facilitating SCM activities such as insourcing, processing and outsourcing (Smit, 2017; and Herman & Stefanescu, 2017). Furthermore, the security system for using EAA, require basic education for understanding (Ruiz & Kovács, 2016). By educating employees in software and hardware systems, standardisation and Web-Interface, enterprise integration and administration, information resources and cloud computing skills could stimulate their learning capacity and skills expertise (Mantzana, Themistocleous & Morabito, 2010; Ferreira *et al.,* 2013; and Bowersox, Closs, Cooper & Bowersox, 2013).

SMEs without formal education need to be associate themselves with environmental expertise with higher corporate participation in voluntary programs (Said, 2011). As a matter of fact talent management applications deal with; workforce planning; workforce acquisition that covers recruitment, selection and induction, performance management, career development, succession planning, learning management and compensation management (Little, 2010). Talent development focusses on learning, career development, leadership development, performance feedback, and recognition. EAA provides opportunities for challenging work assignments with a strong learning curve, and a career path to every employee. Flexible talent management could provide employees with learning abilities through on-line opportunities that requires less computer skills to learn ISC (Naim & Lenka, 2017). More knowledge could be acquired through the advancement of educational programmes and skills development that could intensify better understanding for the Actual Adoption of EAA for SCM.

2.5.3.3 Lack of Technical Skills from Employees for the Actual Adoption of EAA

Lack of technical skills could be regarded as human gap in 4th Industrial Revolution with little or no skills in using electronic mechanisms to cope with the demand in the market. The technological aspect for adopting EAA requires technical skills for incorporating mainframe or otherwise personal computers with relevant application software system could ease the adoption of EAA (Yeo, Gold & Marquardt, 2015; Bradic-Martinovic & Dorel, 2016; and Moran, 2016). Financial expertise for SMEs have all the powers to determine the technical skills for employees that are encrypted in their abilities that are regarded as a key factor for a successful adoption of EAA for SCM (Bagorogoza & de Waal, 2010; and Naim & Lenka, 2017).

Human capital development fosters employee's talent by developing blue collar employees for building technical talent; managers for building operational talent; and executives for building tactical talent for SCM (Lawrence, 2017; and Mlangeni, 2017). SMEs need to network with business mentors to seek advice and to outsource technical assistance in the Actual Adoption of EAA for SCM (Karim, 2011; and Seth, 2017a). In a study by Little (2010), it is postulated that there is a need to align learning and development activities for SMEs to complement strategic business with strategic needs and values, which includes a shift from measuring internal resources for measuring outputs, the diversification of learning delivery options that comprises greater use of e-learning, electronic performance support systems, streamlining management processes and systems which is aimed at improving service levels, efficiency and responsiveness in SCM. For SMEs to become competitive, they need to employ labour with competitive skills matching the job description and qualification criteria (Coulson-Thomas, 2012).

SMEs faces complex processes that brings more challenges in dealing with technical skills in the Actual Adoption of EAA for SCM (Zailani *et al*., 2015; and Sebetci, 2019). Technical abilities assist SMEs in sharing experience (Smith & Barrett, 2016). EAA is a fundamental part of the enterprise that requires technical expert skills (Dias, 2016; Vatsa, 2010; and Arisar, 2016). In some instances, lack of grow and advancements in technological innovation could be caused by lack of education and computer skills. In the next content, the internal factors affecting the adoption of EAA are discussed.

2.6 Emperical Literature

2.6.1 Internal Factors affecting the adoption of EAA for SCM

In this section, internal factors are discussed and how they influence the Actual Adoption of EAA for SCM in SMEs (Flower, 2018b; and Crain, 2018). Internal factors are aspects from within the organisation that affect the organisation, which include employees, organisational culture, processes and finances (Voges & Pulakanam, 2011; and Jessee, 2019). In this research, internal factors are; Owners' Characteristics, Enterprise Resources, Information System Components and Employees' Competencies. The internal environment significantly influence ERP that is linked to SCM (Asmundson, 2017; and Igriany, 2018). To lead in turbulent times managers respond to internal complexity (Roland *et al.,* 2015).

Profitability, productivity and efficiency are dependent on good management of the internal processes of the business (Kaya & Azaltun, 2012; and Sherman, 2018). The benefits of information sharing and integration are attained due to incompatible systems, platforms and high maintenance costs coupled with a lack of understanding of the true purpose, value and power of integrated Information System Components (Ardley *et al.,* 2016). The implication of this is that internal factors might make the Actual Adoption of EAA.

2.6.1.1 Owners' Characteristics

Owners' Characteristics include sub-variables such as passion for SMEs success, creative thinking and creative mind-set in risk taking, discipline, innovation, vision orientation and owner's resilience. The characteristics are discussed below.

2.6.1.1.1 Passion for Enterprise Success

Passion is regarded an internal desire that act a driving force for entrepreneurs to excel in day-to-day enterprise operations. As a result, motivation for enterprise success is a necessary measure for innovation and transformation (Metcalf, 2015). Entrepreneurs with passion survive tough times and circumstances from internal and external environmental challenges and forces with low economic benefits, if they are passion (Stok, 2018). The desire to promote innovation is manifested through the exploration and risk taking that promote learning skills through collaborative activities

(Zaugg & Warr, 2018). An entrepreneur's passion demonstrates the success or failure for the enterprise if correct knowledge and energy they are not directed towards, more especially in this era of the 4th Industrial Revolution with the adoption of EAA in SCM.

2.6.1.1.2 Creative Thinking and Mind-Set in Risk Taking

Promoting creativity and innovation is encouraged by collaboration and allowing mistakes (Thompson, 2018b; and Zaugg & Warr, 2018). It is associated with perceived gains and losses if no action is carried out (Gao & Hafsi, 2015). Traditional success criteria like product efficiency, in the 1960s and 1970s and quality management in the 1980s and 1990s have been replaced by creativity, innovation and knowledge based economic factors (Sarri, Bakouros & Petridou, 2010; and DesMarais, 2014). Entrepreneurs possess risk-taking mentality, balanced with the instinct of not taking risk that could destroy reputation (Trinh-Phuong *et al.,* 2012; Jenkin, 2016; and Liu, 2015).

Risk taking identifies three core-competencies, namely, self-confidence, resistance to change and determination for achievement (Sun, 2011; and Broughton, 2018). SMEs owners are often mentioned as a high-risk group. Risk taking leads to better return-on-investment (Svärd, 2013; and Ahmad & Mehmood, 2015). Creative thinking stimulates IT approaches with eased possibilities for the adoption of EAA.

2.6.1.1.3 Discipline for Action Orientation

Discipline for action orientation opposes the anti-reaction against long-term solutions adopted for improved business interest (Sarri *et al.,* 2010). Entrepreneurs' focus eliminates the level of deviation from their actual calling that is treated as a success factor, which is defined by the level of stubbornness on their action orientation with stubbornness (Seth, 2017b; and Gao & Hafsi, 2015). Mediation and negotiations with both internal and external stakeholders, projects an entrepreneur as reliable (Ghosh, 2018b). Thought-oriented strategies based on ignoring irrational beliefs and assumptions, mental imagery of successful future performance and positive self-talk have merits for the entire SME (Ghosh, 2015a; Kharytonov, 2012; and Ardley *et al.,* 2016). Big challenges require a rational mind-set with positive ambitions that leads to a remarkable success (Post, 2017; Ghosh, 2018b; and Hendricks**,** 2018). These

studies outlined that entrepreneurs should play a major role in action orientation in functional areas that include sales and marketing; manufacturing and production; finance and accounting; and Human Resources Management (HRM).

2.6.1.1.4 Innovation Abilities

Innovations could be regarded as process of applying new versions in IT that enhance SMEs performance based on creative thinking and capabilities with entrepreneurial motivation of business owners and employees (Sun, 2011; DesMarais, 2014; and Broughton, 2018). Integrating knowledge on production with creativity, leads to understand the implications of creative activities in the production process (Giovannoni & Maraghini, 2013; and Hon & Lui, 2016). Self-leadership supported by a positive creativity climate can make synergistic use of creativity and innovation for generating sustainable competitive advantage (Ghosh, 2015a; and Jenkin, 2016).

Family embracement play a significant role in facing both enterprise and IT challenges (Genever, 2017; and Butterfield, 2017). Entrepreneurs' intense focus on faith in their idea may be misconstrued as stubbornness, but it is this willingness to work hard and defy the odds that make them successful (Seth, 2017b; and Tumenta, 2016). These studies outlined the need for encouragement and emotional support towards the entrepreneur in their innovation efforts.

2.6.1.1.5 Vision Orientation

Vision orientation is the ability to put in practice dream through enterprise project planning. Entrepreneurs are determined hard-working and forward looking in pursuit of their goals (DesMarais, 2014; Liu, 2015; and Broughton, 2018). Much of the current literature on vision orientated entrepreneurs pays particular attention to greater productivity (Johnson, 2017; Stok, 2018; and Broughton, 2018). Visionary techniques in entrepreneurial orientation can be used to facilitate and enhance aspects such as idea generation, team building, idea evaluation, data collection and implementation, decision making and analyses (Sarri *et al.,* 2010). Undesirable negative relationships amongst trading partners and lack of cohesion among group members can shrink the vision of the SMEs, and poor decision-making and involvement can reduce attitudes of resistance to change (Hon & Lui, 2016). Entrepreneurs formulate overall vision,

mission, strategic planning, strategic organising and staffing, strategic control and crisis management for efficient SCM (Zandbergen, 2018b). A well-structured and formulated long-term perspectives that are well aligned with required resources may lead to the accomplishment of future goals (Khalifa, 2016; and Hillstrom, 2018). Direct focus on enterprise routine activities in line with IT could help in the adoption of EAA for SCM.

2.6.1.1.6 Owner's Resilience

Owner's resilience is regarded as internal driving force that is evident in their self-assurance, elasticity and flexibility for coping with both internal and external forces challenging their routine-business activities. Owner's resilience is linked to behavioural rather than an attitude or a trait that ensures adaptation to adversity (Eckler & Bolls, 2011; and Roland *et al.,* 2015). Measuring individual differences regarding resilience to work interruptions for relating with other key constructs of employee effectiveness (Kuntz *et al.,* 2017; and Mills, Shahani-Denning & Sweetapple*,* 2017).

Excellence and integrity are linked with factors for rewarding employees for outstanding efficiency and effectiveness (Quible, 2013). The effects of owner's-manager values on a small firm's survival is dependent upon growth orientation (Sjögrén *et al.,* 2011). An entrepreneur who operates a SMEs from the grass-roots with little capital, practices relative merits of different routes to high performance standards irrespective of the intensity of challenges by adapting to circumstances for greater rewards (Coulson-Thomas, 2012). The owner's resilience speaks resemble their level of dedication by taking drastic measures in the adoption of EAA.

2.6.2 Enterprise Resources (ERs)

SCM does not operate in isolation from other functional departments, such as, operations, purchasing, sales and distribution. ERs include Financial Resources (human resources), mainframe or personal computers, Application Software System Hardware systems and expert personnel (Karim, 2011; Toor, 2016; McPeak, 2018; and Chen, Hailey, Wang, & Yu, 2018). Identifying and integrating common resources across the SMEs leads to reasonable competitive advantages within and across business units (Fotheringham & Saunders, 2014; and Toor, 2016).

Integration of ERs such as; finance, physical, human and network connectivity is success factor, as other sources could be used through the SMEs and other trading partners (Mills *et al.,* 2013; Jenner, 2016; and Maverick, 2018). Gross-functional activities leads to sustainable economic success for SMEs, depending on marginalisation of economic and financial costs (Mills *et al.,* 2013; Fotheringham & Saunders, 2014; and Jenner, 2016). The failure to acquire sufficient capital via savings or financial institutions borrowing would lead to difficulties in purchasing ERs.

2.6.2.1 Financial Resources

IT systems includes three basic elements; business processes; applications; and infrastructure (Trinh-Phuong *et al.,* 2012; Ingram; 2018; Segal; 2018; and Hamlett; 2018). Therefore, the Financial Resources includes the following sources of financing;

- Business partners for a legal partnership that is formed via partnership agreement and contract (Lorette, 2018);
- Start-up investors for contributing Financial Resources towards SMEs in the form of shareholding (Kehring, 2018);
- Entrepreneur's personal savings or credit that encourage entrepreneurs to automate their bill payments to avoid interest charges via credit card (Newlands, 2018);
- Crowd funding being available from guaranteed profits in retained earnings, proceeds from shares, accounting and economic profits that are accumulated from different investment options (Althuser*,* 2018*)*;
- Business grants that are available during the start-up includes; equity finance, tax reliefs, soft loans, growth charter scheme, growth accelerator and connection vouchers; and
- Commercial lending include long term liabilities such as; long-term fixed interest, commercial mortgage, interest-only payment loan, refinance loan, hard money loan, bridge loan and blanket loan (Becker, 2016).

Financial institutions requires security as a leverage for any cent borrowed, of which it includes the controls measures that covers payback-period, insurance, flotation costs such as; underwritten costs and administrative costs.

2.6.2.2 Competent Human Resources

In this study, Competent Human Resources is defined as the ability to cope with the challenging enterprise activities that require educational and technical aspects. Competency in SCM starts with by developing employees competencies (Vetráková, Smerek & Seková, 2017). The adoption of EAA could ease the control on database for employees by tracking performance, measuring job openings and streamline compensation (Hazen *et al.,* 2014; Ross, 2018; and Wayner, 2018). CHR is based on the basis of modern methods of measuring human development, such as performance standards, based on performance appraisal (Abbott, Kung, Cegielski & Jones-Farmer, 2013). Human resource function focuses on the way in which SCM or division is evolving towards lean-manufacturing and performance work systems examining the impacts on employee interests and considering alternatives to the lean model (Jiang & Liu, 2015; and Israelstam, 2015).

Skilled and proficient employees are every employer's aspiration, as they minimise costs on training and development for the adoption of EAA. SMEs formulate proper performance standards based on performance goals through documentation of all employees' personal record and by promoting a healthy contractual relationship that is based on trust and cooperation (Dyer *et al.*, 2015). By considering the personal traits and realities of employee complaints, suggestions from personnel and realising talent among existing employees both promote and develop confidence and trust (Leonard, 2018). Also by taking into account the enterprise cultures and work environment the adoption of EAA is a global trend for business success (Viets, 2014). A competent employees would simplify the SMEs' costs in terms of training and development in line with the adoption of EAA.

2.6.2.3 Mainframe and Personal Computers

SMEs choose the computer equipment based on its internal and external needs, to avoid over or under capitalisation for personal or mainframe computers (Ayer, 2010; and Michael & Mike, 2014). SMEs are using IT to perform electronic transactions in SCM activities such as the exchange of money over the Internet (Reynolds, 2018). SMEs use the traditional mainframes based on their stability, manageability and performance (Michael & Mike, 2014). The first personal computers were introduced in

1975 (Knight, 2014) and were regarded as a calculating machine (Thakur, 2018). Personal computers are classified as follows:

- Desktop computers, designed to be used at a desk and they can seldom be moved;
- Notebooks are portable computers designed to fold up like a notebook for carrying and storage of data, information and different documents (Smallwood, 2014);
- Internet notebooks known as netbooks are smaller to desktops and notebooks designed for accessing the Internet (Park & Yun, 2017);
- Tablets are portable computers that consists of a touch-sensitive screen (Klein, 2014); and
- Smart phone are mobile phones that can run applications and has Internet capability (Wempen, 2018).

Mainframe computers were produced in the early 1940s, and they are regarded as bulky machines that required cooling-sensitive rooms (Kayo, 2018; and Jacobson, 2018). Most of SMEs used lap-tops and computer systems to manage, share and process data into a meaningful information, as such the adoption of EAA that could ease SMEs activities in SCM.

2.6.2.4 Application Software Systems (ASS)

ASS are regarded as intangible computer components that are designed to be incorporated in computer hardware to perform certain tasks. ASS are used computer or system hardware discussed in 2.4.2.3 (Ayer, 2010; and Zandbergen, 2018a). ASS is accompanied by complementary free-antivirus that secure the operating system against virus, spam-ware and system hacking (Eckler & Bolls, 2011; and Ellis, 2017). ASS can be installed in a bulky driver in system windows application (Picks, 2018).

Windows 10-powered computers, use Android emulators for enterprises, Manhattan Active Supply Chain, Oracle SCM Cloud, SmartTurn Inventory Management, GAINSystems and Enterprise Supply Planning (Jenic, 2018). Simplifying the work and enabling a productive work schedule, are the reasons for using ASS (Duffy, 2017). Optimisation programs provide a lot of tools in one package (Schofield, 2018).

BlueStacks is an Android emulators used in Windows for teleconferencing; Play-Store gaming experience (Rohit, 2017). Once the SMEs is in possession of mainframe and personal computers, the adoption of EAA for SCM become an easy project to implement.

2.6.2.5 Hardware Systems (HSs)

HSs are the physical aspect of computers, telecommunications and other devices used to perform electronic activities on a Random Access Memory (Zandbergen, 2018a; and Rouse, 2018a). Hardware system refers to computers, telecommunications and external storage tools linked with software systems to produce desired results (Ellis, 2017; and Picks, 2018). The central processing unit is the most important part of all computer hardware that store, process and release data and information (Jacobson, 2018). The other computer hardware is the internal component such as a hard disk drive, motherboard video card, monitor, keyboard, and mouse that are incorporate to function as a one unit (Hyde, 2018). Tasks related to SCM include insourcing, process and outsourcing of data (Poba-Nzaou, Raymond & Fabi, 2014; and Ticlo, 2018). The Global Positioning System (GPS) Emulation could be installed in all hardware for location monitoring in the Supply Chain (Rohit, 2017). Hardware systems could help SMEs to adopt EAA to perform SCM duties such as on; facilities, inventory, transparency, information, sourcing and pricing.

2.6.2.6 Expert Personnel

Expert personnel are regarded as IT specialists with technical expertise in the use of EAA, particularly for the implementation, monitoring or maintenance of IT systems, while the IT specialists focus on a specific computer network, database, or systems administration function (Kocoglu & Kirmaci, 2012; Beal, 2018; and Heakal, 2018). The role of expert personnel is to provide technical solutions for both internal and external users (Coté, 2016). The EAA expert is needed for aligning all technological strategies and execution plans with the SMEs visions and objectives to minimise total average cost and maximise the output level through talent management (Pradhan, 2013; and Ewerlin & Süß, 2016). In some instances, the global financial crisis has flagged the relevance of traditional approaches to talent management as evidence suggesting that it is the responsibility of top management to employ staff with full competencies

(Vaiman, Scullion & Collings, 2012). Just at the pre-phase for the adoption of EAA, SMEs should be able to develop cost-effective measures that will Impact of internet-based communication channels on SCM (Guimarães, 2012; Cote, 2016; Park & Yun, 2016; and Goldenberg & Dyson, 2018). For SMEs to have a proficient EAA, they have to employ or outsource expert personnel who will be responsible for technical assistance to the SMEs can any unforeseen circumstances that could trouble the Actual Adoption of EAA.

2.6.3 Information System Components (ISCs)

ISCs are an integrated set of components for gathering data, storing data and transforming data in the form of usable format known as information that could be used for taking rational-decision making (Zwass, 2018). ISCs include items such as the Transaction Support System, MIS, DSS, ESS, data warehousing and data mining and KMS (Sharma, 2018a). In the 1990s, firms adopted networking standards and software tools that could integrate disparate networks and applications throughout the firm into an enterprise-wide infrastructure (Kelly, 2014; and Mkansi & Acheampong, 2012).

Database management is a prerequisite for Actual Adoption of EAA (Ardley *et al,* 2016). Ownership of ISCs is crucial for enhancing SMEs' privacy and information confidentiality (Accenture, 2012; and Tamrin *et al.,* 2017). SMEs could develop a framework that involves testing different components and interactions and ultimately owning EAA for SCM (Sjögrén *et al.,* 2011; and Weber, Geneste & Connell, 2015). SMEs attempt to design or develop EAA that accommodates flexible enterprise interchange (King, Huggins, Prasanna & Yang, 2017). SMEs need to structure their ISC in such a way that none of the internal or external users will be affected and thus leading to SCM destructions.

2.6.3.1 Transaction Support System (TSS)

TPS is a system used to capture and process detailed information necessary to update data on the fundamental operations of an organisation (Zandbergen, 2018a). The TSS monitors the business operations and involves the operational and financial management cycles (Chen *et al.,* 2018). For example, the accountant and auditors

needs to know what and how these transactions are recorded and processed to produce meaningful information. All of these events are referred to as transactions, and they requires a transaction processing system. Keeping track of such as collection, processing, storing, reporting, source documents, journals and registers, ledger and files; and outline and printing is part of the TSS. The SMEs fundamental operations are linked with transaction processing systems that capture and process the detailed information necessary to update data and produce detailed information (Zandbergen, 2018b). SMEs should have a system that manages both internal and external transactions for effective adoption of EAA in SCM.

2.6.3.2 Management Information System (MIS)

MIS is a set of systems and procedures that collect and transmit data from a range of sources that compile information and present it in a readable format (Ingram, 2018; and Segal, 2018). MIS offerings have existed since the 1960s, when large mainframe computer systems began automating processes at major corporations (Hamlett, 2018). Service reaction time measures how quickly Information System Components react to errors occurring in the communication lines, main frames, and software program (Lee & Rhim, 2014). The history of modern Management Information System Components parallels the evolution of computer hardware and software (Boykin, 2017).

MIS could be regarded as a master program in information management that includes both technology management and experts for its organisation and development (Portugal, 2016). MIS has three main advantages for SCM; supporting tactical planning and subsequently enhancing the decision-making process; for supporting strategic planning and enhancing the decision-making process (Karim, 2011).The use of MIS data leads to improved utilisation of internal and external information (Porteous, 2014; and Segal, 2018). Proper management of information will enhance the adoption of EAA for SCM within and outside the SMEs.

2.6.3.3 Information System Components Governance (ISCG)

ISCG is defined as the specification of decision rights and an accountability framework to ensure appropriate behaviour in the valuation, creation, storage, use, archiving and

deletion of information. It includes the processes, roles and policies, standards and metrics that ensure the effective and efficient use of information in enabling an organisation to achieve its goals (Smallwood, 2014; and Schulz & Dankert, 2016). IT governance relates to decision-making authority, enterprise capabilities, structures, processes, and relational mechanisms that result in an alignment between business and IT (Mohamed, Kaur & Singh, 2012). SMEs that operate without correct measures in internet security governance could be exposed to theft of information, hacking and unauthorised users based on the complexity theory on information ISG (Grant, 2011; and Mishra, 2015).

An appropriate ISG could assist the SMEs in securing its classified information and confidential documents without any computer security bridge by using biometric technology and cloud computing. ISG is used to strengthen the strategic aspects of IT risk and compliance and to have proper information governance (Hagmann, 2013; Smallwood, 2014; and Segal, 2018). ISG is regarded as the specification of decision rights and an accountability framework to ensure appropriate behaviour in the valuation, creation, storage, use, archiving and deletion of information.

It includes the processes, roles and policies, standards and metrics that ensure the effective and efficient use of information in enabling an organisation to achieve its goals (Smallwood, 2014). One feature of SMEs is that they are less likely to have formalised governance and management arrangements than larger firms (Gao & Hafsi, 2015; and Prasanna *et al.,* 2017). The complexity of data storage, sharing, analysis and application integration reflect several challenges for any governance platform in SMEs (Little, 2010; and Truong & Dustdar, 2012). ISG would provide guidance and assurance to SMEs in terms on information security and enterprise modelling for SCM.

2.6.3.4 Decision Support System (DSS)

A DSS is a computer program application that analyses enterprise data into accurate information represented to managers for rational decision-making (Rouse, 2018b; Power, 2008a; and Sharma, 2018b). DSS is a system designed for making rational decision making at the managerial level for managers and deputy managers. The

user-friendly software such as DSS, help managers to make sound decisions (Beal, 2018b). EAA use different components such as spatial analyses and map-based output compared with the existing types of Information System Components (Sun, 2011; and Sewdass, 2012). DSS challenges include high cost of mechanisation, equipment and machinery break down, poor working conditions, ineffective procedures and forms, disorganised file systems with resultant poor control (Karim, 2011; and Ferreira *et al.,* 2013).

Information System Components might face challenges in conceptualising the essential components when addressing needs of different departmental or cross-functional activities (Prasanna *et al.,* 2017). ISC incorporate retrieval components that seek to identify related instructions or operational functions that match user specifications (Gretzel *et al*., 2012). A DSS has the capability of outlining or projecting information graphically with the inclusion of an expert system. DSS are given to dedicated employees based on their competencies (Rouse, 2018b). DSS are also part of MIS for the provision of detailed reports for the activities as it also functions well as Management-By-Objective (MBO) tools (Hamlett, 2018).

A well-structured and designed model DSS provide the ability to create, maintain and manipulate statistical and mathematical models by using capabilities encrypted in modelling packages (Sharma, 2018b). EAA require additional systems to support internal arrangements for SCM (Ramlee & Berma, 2013; and Montilva, Barrios & Besembel, 2014). DSS has the capability to provide managers and deputy managers with the opportunity to be well-informed at all times with the ability to indulge in informed decisions for their enterprises insight aimed at simplifying the work for both executive and tactical strategic levels and ultimately the functional level through the adoption of EAA.

2.6.3.5 Executive Support System (ESS)

ESS refers to a specialised information system used to support senior-level for decision making. An ESS is not only channelled for the top management but for general managers for making strategic decisions to improve the long-term performance of the enterprise (Power, 2008b; and McLaughlin, 2016). Much of the

current literature on ESS pays particular attention on management levels, such as, strategic, tactical and operational levels, and examines how to identify individual performance on a specific task or subtask (Shemi, 2012; Kim, Chan & Gupta, 2016; McLaughlin, 2016; and Zandbergen, 2018b). ESS is used for formulating, structuring and facilitating all executive duties (Watson & Rainer Jr, 1991; and Nimsaj, 2016). ESS could play an important role in SMEs where there is a formal organisational structure that will be channelled with relevant application system for well-defined duties.

2.6.3.6 Knowledge Management Systems (KMS)

KMS refers to applications designed to capture all the information within your organisation and make it easily available to your employees, anywhere and anytime (Smith, 2013; Asif, Braytee & Hussain, 2017; and Birkett, 2018). In other words, a KMS is a knowledge repository software system. Most KMS provide an "information hub" where content can be created, organised and redistributed through search tools and other features that let users find answers quickly (Smith, 2013). KMS supports the decision needs of senior executives (Zandbergen, 2018b). Some of the tangible benefits of using KMS include improved distribution of knowledge; greater information accuracy and consistency; increased employee satisfaction; less-time spent looking for answers; getting new employees faster on-board; and retention of knowledge when employees leave (Smith, 2013).

KMS use different software modules served by a central user interface, with staff training and orientation through the provision or sharing of electronic documents (Birkett, 2018). KMS is use techniques, technologies and tools for SCM support (Andrade, Ares, García, Rodríguez, Silva & Suárez, 2003). The evidence presented in this section suggests that KMS could be used by SMEs to capture all customer and supplier information through an "information hub" where content can be created, organised and redistributed through search tools and other features that provide users with agile answers.

2.6.3.7 Internet and Network Connectivity

Internet and network connectivity is the collective use of network sources such as routers, optic-fibre, routers, switches and gateways linked together with computers, printers, machinery and equipment to produce digital information (Habraken, 2001). In the early 1990s, industrialised firm adopted networking standards and software tools that could integrate disparate networks and applications throughout the firm into an enterprise-wide infrastructure (Mitchell, 2019). The SMEs infrastructure also requires software to link disparate applications and enable data to flow freely among different parts of the business.

Information System Components manufacturing techniques allow the development of advanced Supply Chains (Michael & Mike, 2014; Ellis, 2017; and Tamrin *et al.,* 2017). The advice pertaining to the internet and making the entire SMEs more productive could depend on the nature of internet (Kim, Chan & Gupta, 2016; and Duffy, 2017). Appropriate internet connectivity would ease the information dissemination on both internal and external users on daily basis being accessed anytime and anywhere across the globe for SCM activities.

2.6.4 Employees' Competencies (ECs)

ECs are regarded as a success and mandatory factors that requires a specific educational background and experience from diverse circumstances (Knox & Haupt, 2015; and Jabbour *et al.,* 2015). Assessing ECs includes using a variety of psychometric instruments, such as, self-assessments and 360-degree assessments of the routine role and work situation of employees (Metcalf, 2015; and Rees &Porter, 2015). Formal education and training can enhance ECs (Esposito *et al.,* 2015; Robbins & DeCenzo, 2014; and Kubberød & Pettersen, 2018). The value provided to the ECs is evident in SMEs' performance and user satisfaction (Jiang & Liu, 2015; Filson, 2018; and Camadan *et al.,* 2018). Thorough training for ECs close the gap for illiterate and knowledge deficit as a tool for leading to staff competencies (Esposito, Freda & Bosco, 2015; and Kihn, 2018). The development and management activities leads to professional and productive activities that are embodied in intellectual gratification (Filson, 2018). A large growing body of literature has investigated that internet connectivity that includes three networks, namely:

- Local Area Network (LAN), which is regarded as a digital network that transmits digital signals from a sever machine via modem or router, to a computer system into analogue form that travels up to 500 meters through an office or floor of a building, transmitted over analogue telephone lines (Shelly & Vermaat, 2011; and Laudon & Laudon, 2018);
- Metropolitan Area Network (MAN) it is regarded as a network that is larger than LAN and smaller than WAN, located within a central geographic location or a city (Beal, 2018b; Fairhurst, 2001, Kuhn *et al*., 2016; and Rouse, 2018c); and
- Wide Area Network (WAN) is regarded as a digital network that transmits digital signals from a sever machine via modem or router, to a computer system in the analogue form, which travels around the global community without any limits through an office or floor of a building, transmitted over analogue telephone lines (Laudon & Laudon, 2018; and Mitchell, 2019).

There is no doubt that ECs exempt the SMEs from additional financial stress on cost for employees' training and development. The following competencies are required for a flexible adoption of EAA for SCM (Atlassian, 2018; and Bridges, 2018):

- Employee communication skills;
- Constructing tables and columns;
- Standardisation and web-interface;
- Using email and internet interfaces;
- Creating and formulating word documents;
- Creating and formulating Microsoft documents;
- Project the ability to troubleshoot the internet disconnections; and
- Creation of business networking for suppliers and customers.

Standardisation and web-interface are approved, accepted and customary specifications that have gone through a process of voluntary consensus within Supply Chain activities that evolve from a customised specification and consensus (Burson, 2015). Internal integration are cross-functional unification, standardisation, simplification, compliance, and structural adaptation (Bowersox *et al.,* 2013). Recent trends in quality management include compliance with or conformance to standards for meeting minimum requirements in SCM activities. Supplier integration focuses on

capabilities that create operational linkages with material and service-providing Supply Chain partners. Although customers are the dominant focal point or Supply Chain driven, overall success could also depend on strategic alignment, operational fusion, financial linkage and supplier management. Competency in supplier integration results from performing the capabilities effortlessly in internal work processes (Karim, 2011; and Weber *et al.,* 2015). A wide-ranging framework for effective implementation of standardisation is completed through the use of the correct operational strategy (Shalder, 2015; Ticlo, 2018; and Ticlo, 2018). If the business environment is heterogeneous, then application architecture has a great way to either design for or trend towards standardisation (Nickolaisen, 2018). The evidence outlined in this *section suggests that standardisation and web-interface could be of a positive investment depending on proper equipment and computer software that are purchased to structure the SMEs on-line transactions.*

2.6.4.1 Enterprise Integration and Administration (EIA)

EIA is defined as the incorporation for the entire enterprise activities and the system administration that produce solid outcomes for SCM. Enterprise integration and administration is an extension of Computer Integrated Manufacturing (CIM) that integrates financial or executive decision-support systems with manufacturing, tracking and inventory systems, product-data management, and other Information System Components (Gulati & Baldwin, 2018). The Supply Chain Integration systems (SCIs) embraces major systems and interfaces such as Enterprise Resource Planning (ERP), communication systems, execution systems, and planning systems. s systems becomes more integrated within an organisation and provides more and more information, the likelihood of discovering any inefficiencies within that system also increases (Bowersox, 2013; and Beal, 2018b). This provides the confirmation EIA work as joined component that includes both hardware and software system for a progressive SCM.

2.6.4.2 Information Resources Managemnt (IRM)

Information resources is a series of internal and external business information resources such as data, database system, financial, economic and operational models that are reliable and valid to produce desired results in SCM (Little, 2015; and

Richards, 2018). Information resources are used for the combination of internal and external business resources that provide the background necessary to evaluate current performance and plan future progress. Knowing the types of information resources that are most critical to business can help companies plan for capturing, analysing and using that information most effective (Richards, 2018). SMEs with a progressive SCM require a strong commitment to the supportive capabilities and resources required for technological advancements (Bowersox *et al*., 2013). In SCM, this requires an increased complexity in technological standards to increase the production efficiency and effectiveness of SMEs, and subsequently reduce their cost implications and extended waiting periods for transacting any items (Iyamu & Mphahlele, 2014; Sambartolo, 2015; and Mustafa *et al*., 2016). EAA could help SMEs to have IRs and SCM to have its daily operational activities in order.

2.6.4.3 Enterprise Resource Planning (ERP)

ERP systems is developed from the increased need for a system that integrates core business processes (Robinson, 2015). ERP helps SMEs to increase their total revenue or decrease total costs (Butterfield, 2017; and Ross, 2018). ERP integrates the business processes of an entire enterprise into a single software system that enables information to flow seamlessly throughout the organisation (Beal, 2018c). ERP is intended to incorporate all aspects of a company's functional operations (i.e., production, planning, material purchasing, inventory control, logistics, accounting, finance, marketing and HRM) by creating a single database that can be shared by the entire organisation and its trading partners (Vikas, Khan & Sultanpur, 2010; and Min, 2015).

ERP improves problem-solving capability among employees and is an important prerequisite for successful ERP development and implementation (Consumer Goods Council of South Africa, 2019). Enterprise systems integrate the significant business processes of an entire enterprise into a single software system that enables information to flow seamlessly throughout the organisation (Beal, 2018c). ERP is intended to incorporate all aspects of a company's functional operations incorporating production planning, material purchasing, inventory control, logistics, accounting, finance, marketing, and human resource management by creating a single depository

of the database that can be shared by the entire organization and its trading partners (Min, 2015).

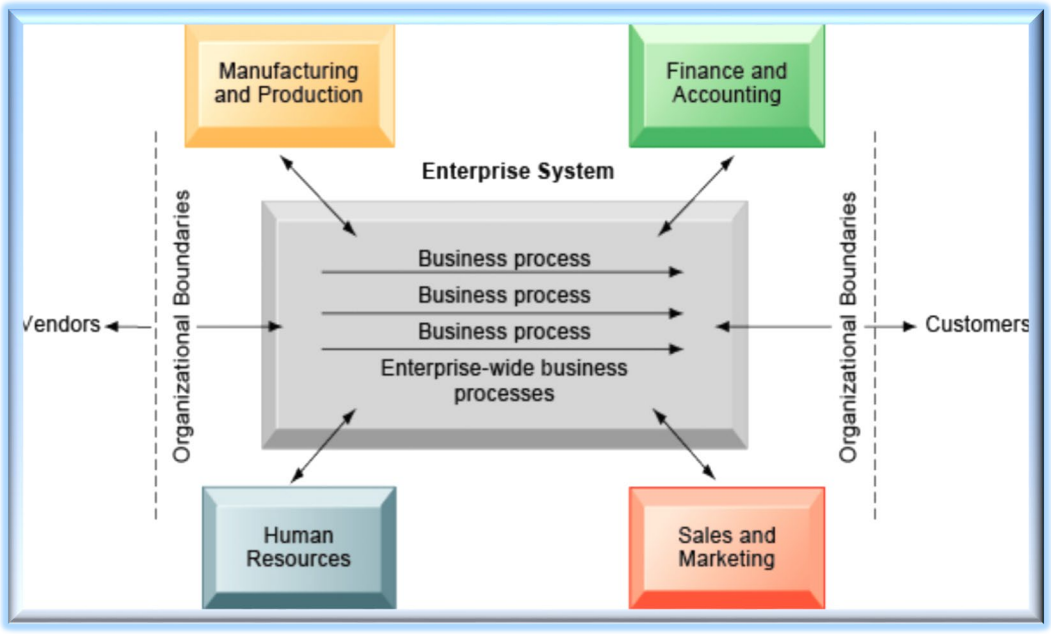


Figure 2.1: Enterprise Resource Planning (ERP) Systems *Laudon et al., 2007:61*

ERP is being implemented in almost entirely within enterprises regardless of its method and spread of operations (Vikas, Khan & Sultanpur, 2010). SMEs' ought foster and reward open communication with frequent interaction, since it would improve ERP-related problem-solving capability among employees as an important prerequisite for successful ERP development and implementation (Hwang & Hokey, 2015). The studies presented thus far provide evidence that traditional enterprises collect data from various key business processes and store the data in a various incomprehensive data source (manual storage) where they can be used by other parts of the business without corrective measures on the accessibility of sensitive and confidential financial data.

2.6.4.4 Spreadsheets utilisation and merging documents

During the past 40 years, much more information has become available in software that took centre stage in 1978 when Dan Bricklin and Bob Frankston produced VisiCalc, the first electronic spreadsheet (Ayer, 2010). Excel is a great place to clean up data and hammer it into shape before you use it in another system (Branscombe,

2018). The use of conjoint analysis and TAM in information system design to identify factors which affect user satisfaction and system usage (Lee & Rhim, 2014). Enterprise Spreadsheet Manager (ESM) keeps records for every transactional change of when the changes made, and by stipulating the old and new value in effect (Berlind, 2007). When merging documents there will be interchange between systems as they always export and import data with comma-separated values (CSV) files.

As an alternative for leaving corrupted CSV with an error-prone and end-users they could import, merge and export data or information at any given time (Branscombe, 2018). The positive light when documents are merged that could simplify the work for separating related documents from multiple areas, each document will not lose its page design and arrangements (Kelly, 2018). The relevance of spreadsheets utilisation and merging documents could assist the enterprises in simplify routine activities such as; financial recordkeeping, human resources profiling, customer ratings and tracking for SCM.

2.6.4.5 Communication capabilities

Several studies thus far have linked communication capability to new ways of decreasing perceived opportunities in a non-threatening manner, or consequences of different ways of communicating changes in EAA used in SCM (Kamleitner *et al.,* 2012; Stok, 2018; Rao, 2008). In recent years, communication creates better relationships that highlights coordination for both the enterprise and business partners by evaluating ideas. (Chatterjee, 2017; Zaugg & Warr, 2018). Furthermore, innovation and entrepreneurship education will change their mind-sets and enhance their entrepreneurial spirit, teamwork, leadership and communication skills (Sun, 2011).

There is unambiguous relationship between communication capabilities and SCM, thus in modern information and communication technologies can be used to develop suitable EAA for netter managerial capabilities that support external stakeholders (Smith & Barrett, 2016). In-house communication across the entire enterprise yield common and mutual understanding and to some extend been overleaped to external customers as a result of SCM advocacy based on greater productivity and new prospect or sales accumulation (Kozicki, 2017). Communication was mend for

facilitating SCM systems (Oracle…2018). The studies presented in thus far provide evidence that better communication abilities from the entrepreneur conducted within and outside the enterprise will develop a positive image for the enterprise and automatically grow both revenue and profit.

2.6.4.6 Interpersonal skills

What we know about interpersonal skills is largely based upon empirical studies on the willingness to learn and to develop greater efficiency and effectiveness that leads to productivity (Chatterjee & Das, 2016). Interpersonal skills are defined as an integral part of personal traits that help to explain individual behaviour on traits such as locus of control, Machiavellianism, self-esteem, self-monitoring, and risk-tolerance for enterprise expansion (Robbins & DeCenzo, 2008). An important aspect for the successful implementation of EAA is to encourage the communication level among the professionals from all internal and external functions of the SCM (Ardalan & Ardalan, 2009). Partners include initiators who conceive the idea but who need a partner to operationalise it, and joiners, those who join an existing business to provide special skills (Catley & Hamilton, 1998).

In the workplace the mix of people in relations to gender, race, ethnicity, disability, sexual orientation, age, and demographic characteristics such as education and socio-economic status complicates the attitudes of people and make management of diversity important when adopting new technology (Appelbaum *et al.,* 2015). The skills development courses enhance employee development and growth been linked with their level of specialisation (Zaugg & Warr, 2018). The degree to which members are alike in terms of personal attributes, attitudes, values or demographic characteristics increases interpersonal attraction and cohesion (Hon & Lui, 2016). Together these studies provide important insights into entrepreneurs to strive for more knowledge through advancement of educational credentials and initiating skills development for themselves and later be extended to their employees that could intensify better understanding for EAA on SCM.

2.6.4.7 Using the internet (Microsoft Windows)

A large growing body of literature has investigated that internet connectivity, includes; local area network (LAN) metropolitan area network (MAN) and wide administrative network (WAN) and application software systems and any other electronic mechanisms used to capture, store, process, manipulate and update information (Beal, 2018b; Fairhurst, 2001, Kuhn et al., 2016; Rouse, 2018b). Three networks are defined as; (a) LAN which is a group of computers and associated devices that share a common communications line or wireless link to a server; (b) MAN is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network but smaller than the area covered by a wide area network (Rouse, 2018b); (c) A wide area network regarded as a geographically distributed private telecommunications network that interconnects multiple local area networks).

In an enterprise, a WAN may consist of connections to a company's headquarters, branch offices, colocation facilities, cloud services and other facilities (Rouse, 2018b). Typically, a LAN encompasses computers and peripherals connected to a server within a distinct geographic area such as an office or a commercial establishment. Computers and other mobile devices use a LAN connection to share resources such as a printer or network storage (Rouse, 2018b). A service oriented architecture (SOA) arises when a firm need to interchange information to its partners in order to exemplify the use of the proposed SOA for building services and facilities management in general, the researcher describe an suggestive case study regarding its use, namely the integration of wireless sensor networks (WSNs) in the overall enterprise architecture (Malatras *et al.,* 2008).

Any email could be linked with internal LAN-based alerts such as SMS notification (Berlind, 2007). Software system is regarded as an application is any program, or group of programs, that is designed for the end user. Applications software (also called end-user programs) include such things as database programs, word processors, Web browsers and spreadsheets (Beal, 2018a). Enterprises are able to take full advantage of their information resources, thereby maximising benefits, capitalising on opportunities and gaining competitive advantage with policies and governance in

place via the internet (Van der Walt & du Toit, 2007). An interactive approach on benchmarking measure the relative value of competitors' threats against best internal operations (Mathaisel, 2004; Janssen & Cresswell, 2005). On contrary, the integrative approach seeks to reconcile the firm's divergent interest and with mutual benefit as an outcome of the specific use of EAA (Bahli & Ji, 2007; Israelstam, 2015). For a complete and comprehensive application of supply chain in IT sufficient cash has to be directed into the overall enterprise operational-strategy (Reyes *et al.,* 2015). The evidence provided about using the internet (Microsoft Windows) maintain that all networks or internet connectivity could assist the enterprise in enjoying the best possible way for sharing information to-and-from just with a click of a button.

2.6.4.8 Enterprise integration and administration

A comprehensive supply chain information system (SCIs) initiates, monitors, assists in decision making, and reports on activities requires for completion of supply chain operations and planning (Bowersox *et al.,* 2013; Gulati & Baldwin, 2018). Enterprise integration and administration (EIA) – EIA might be regarded as an extension of computer integrated manufacturing (CIM) that integrates financial or executive decision-support systems with manufacturing, tracking and inventory systems, product-data management, and other information systems (Gulati & Baldwin, 2018). Any enterprise seeking supply chain integration should also demonstrate strong commitment to the supportive capabilities of segmentation, relevancy, responsiveness, and flexibility.

Therefore the supply chain integration systems (SCIs) embraces major systems and interfaces such as; enterprise resource planning (ERP), communication systems, execution systems, and planning systems. System becomes more integrated within an organisation and provides more and more information, the likelihood of discovering, inefficiencies within that system also increases (Bowersox, 2013; Bailry *et al.,* 1998; Beal, 2018b). The more advanced the computer systems, the greater the possibilities of reducing routine work carried out by capturing data. Likewise, integrated systems organise and disclose the enormous amount of information about the workings of the total system (Boxall *et al.,* 2008). EAA support every activity involved in strategic level for high performing ratings for the enterprise (Vetráková *et al.,* 2017; Lawrence, 2017).

Overall, these studies provide important insight into the development of enterprise integration and administration that could assist the enterprise in information dissemination to both internal and external business world.

2.6.4.9 Standardisation and web-interface

Recently, researcher have shown an increased interest in standardisation and web design in EAA based on its essential features of quality management and standardisation of policies, procedures, systems and processes that facilitates coordination, which compels organisations to spend a proportion of cash on training their employees (Ferreira *et al.,* 2013; Burson, 2015; Akella *et al.,* 2009). Recent trends in quality management include a shift in emphasis with compliance or conformance to standards for meeting minimum requirements. Capabilities support internal integration which are cross-functional unification, standardisation, simplification, compliance, and structural adaptation (Bowersox *et al.,* 2013).

Supplier integration focuses on capabilities that create operational linkages with material and service-providing supply chain partners. Although customers are the dominant focal point or supply chain driven, overall success will also depend on strategic alignment, operational fusion, financial linkage, and supplier management. Competency in supplier integration results from performing the capabilities effortlessly in internal work processes (Karim, 2011; Weber *et al.,* 2015). Standardisation and Web-Interface (SW-I) – SW-I Official" standards are specifications that have gone through a process of voluntary consensus.

There is potentially a clear path for projects to evolve from a de facto specification to one that is standardized through voluntary consensus that includes; developer identifies problem and proposes solution to peers, peer community provides feedback and proposes potential alternate solutions in public channels like GitHub or Google Groups, peer community reaches mass consensus and hands specification off to a standards body and developers implement solution while the standards body formalizes and legalizes the standard (Burson, 2015). A wide-ranging framework for effective implementation of standardisation is completed through the use of the correct operational strategy (Ticlo, 2018; Ticlo, 2018; Lawrence, 2017; Shalder, 2015). The

following standardisation strategies could be used; part standardisation (common parts are used across may products), process standardisation (it involves standardising as much of the process as possible for different products, and then customising the product as late as possible, product standardisation (a large variety of products may be offered, but only a few kept in inventory), and procurement standardisation (involves standardising processing equipment and approaches, even when the product itself is not standardised) (Simchi-Levi *et al*., 2009).

In the service profit chain where the employee and customer interface is central, it compel the user to understanding the worker dimension is poorly developed (Heskett *et al.,* 1997). If the business environment is heterogeneous, then application architecture has a great way to either design for or trend towards standardization (Nickolaisen, 2018). The evidence presented in this section suggest that standardisation and web-interface could be a positive investment provided proper equipment, computer software are purchased to structure the enterprise on-line transactions.

2.6.4.10 Assets Management

Aassets management is defined as the use of financial instruments aimed at maximising invested assets for managing wealth in the world economy (Wittrock & Heiden, 2020). A comprehensive asset management strategy could marginalise noncompliance against tax invation and avoidence with a formidable information gathering in a quick and reliable ways as a mandatory command from statutaory regulators through innovative structures such as the adoption of EAA in SMEs (Ford, 2019). As a matter of fact, fixed assets are acquired by SMEs accumulating profit, of which the acquirer should determine whether the assets are financially justified through costs and benefits (Gitman & Zutter, 2015).

Overall, assests management could be linked with software programs that vary in many ways but quaranttee quality through; a) flexibility, by using software program that is adaptable to any assets within the enterprise; b) energy and cost efficiency, by maintenaning management program that is effective, so as to allow assets to operate at better energy and cost efficiency; c) affordability, by purchasing a software program

that is cost effective with ultimate results (Daudi, 2019). The capital asset pricing model (CAPM) could be used to describes the relationship between the required return (r_s), and the nondiversifiable risk of the firm as measured by the beta coefficient (*b*) (Learch & Melicher, 2018). The payback period method could be used by SMEs to determine the minimum number of years to settle the account against the initial investment amount (Alsemgeest, du Toit, Ngwenya & Thomas, 2014). By drawing on the concept of assets management, it is evidence that the success of SMEs depend on proper assets valuation and other determents for entrepreneurial success.

2.7 External Factors Impacting the Actual Adoption EAA for SCM

External factors are factors that affect the enterprise directly from both the competitive market-environment and macro-environment business perspectives with regard to threats and opportunities. External factors are discussed to determine their influence on the intended Actual Adoption of EAA for SCM management in SMEs (Hawks, 2019). The external environment has a significant influence on decisions taken in SMEs (Beal, 2018). SMEs justify the costs and expected benefits before proceeding with new investments in technological advancements (Trinh-Phuong *et al.,* 2012; and Epe, 2015). SMEs use external Transaction Support System from external sources, such as current prices from competitors, inflation and interest rate (Laudon *et al.,* 2018; and Asmundson, 2017).

2.7.1 Complex Legal and Regulatory Constraints

Through business regulatory systems governments affect businesses via trading policies, import and export quotas, in some developed economies that have legal and regulatory requirements in place (Jooste, Strydom, Berndt & Du Plessis, 2016; and Mzekandaba, 2018a). The quick rise of technological advancements introduced a host of legal and ethical issues with copyright and intellectual property compliance as a result new ethical and legal considerations that are constantly arising (Walcerz, 2019). Legal complexity is used to refer methods to measure and monitor the legal aspect of an entity governed by legal theorists, statutory regulators such as Competition Commission of South Africa, Consumer Board of South Africa and many more, so as to reflect on particular law's complexity to adhere to trading standard and norms (Ruhl& Katz, 2015). Regulatory constraints have been suggested. This study uses the

definition of the forces that every enterprise should compete for in order to execute its strategy based on period, assets, liquid assets, resources, quality, regulatory compliance, interests of stakeholders, organisational culture and rick tolerance (Spacey, 2019). The business regulations by government includes; regulatory instruments for markets, social customs, and technology (Leenes, Palmerini, Koops, Bertolini, Salvini & Lucivero, 2017; and McKinlay, Pithouse, McGonagle & Sanders, 2018). Outsourcing strategies should be at par with regulatory goals and within a Corporate Social Responsibility framework so as protect the image of the SMEs (Schulz & Dankert, 2016).

Legal frameworks are developed to achieve a competitive advantage by challenging prevailing SMEs models and exploiting gaps in legal and regulatory environments (Rossi, 2014). The illegal copying of software could be minimised through the use of custom-based product keys and other forms of biometric technology (Frenz, 2017; and Quintia, 2019). The legal factors regulating SMEs on the adoption of EAA should eased so that SMEs will have a better competitive advantage and cost-benefits analysis that could assist the SMEs for economic tool to aid in decision-making for any legal matter arising.

2.7.2 Lack of External Financing

External financing can be in the form of bonds, loans and debt financing or to acquire funds business angels and venture capitalists as a way of raising capital rather than retained earnings (Harvey, 2012; and Althuser, 2018). External financing result in a financial burden of interest rate being charged (Rossi, 2014). This has negative implications on both the banks and customers as they bear a financial burden with exorbitant interest payable (Gerber, 2018). Financial service companies are competing with fluctuating market interest rates that affect the SMEs (Mulesoft, 2009). From external view the acquisition of funds depend on creditworthiness, financial statements, feasible business-plans and bank statements (Guimarães, 2012; and Ritchot, 2013). Companies are increasingly unprepared to effectively integrate advanced technological infrastructure that require additional capital (Benay, 2016). Limited expansion on opportunities are as a consequence of slow GDP growth and a lack of external financing for SMEs (Brooks, 2019). Personal saving could save

entrepreneurs from the financial burden of high interest rate from acquisitions of mortgage bond, long-term loans, equipment lease, micro loan, accounts receivable factoring and merchant cash advance.

2.7.3 Low Technological Capacity

Low technological capability is the inability to absorb technology to transform operations as a way of maximising production efficiency and gaining competitive advantage within SMEs (Reichert & Zawislak, 2014; and Spacey, 2015). Technological capacity is a sustainable enterprise capability by applying new technologies in order to improve the innovation performance (Khalifa, 2016). SMEs have different business requirements, diverse technological standards and IT system for sharing data and information (Suhadak & Mawardi, 2017; and Wayner, 2019).

The absence of technological capacity leads to low network capacity which, in turn, leads to slow processing systems for transactions for both internal and external partners in SCM (Buckow & Rey, 2010; and Del Carpio & Miralles, 2018). Development in technological transfer is critical to remove barriers and close gaps in achieving increased SCM proficiency (Ann, 2019). Innovation through technological capacity could accumulates positive results for the SMEs (Del Carpio & Miralles, 2018). New entrants to the business markets bring new capacities leading to an automatic increase in competition (Endro *et al*., 2017). SMEs with good intentions will adhere to technological capacity by investing enough cash on modern technology that could assist them in the adoption of EAA.

2.7.4 Relative Advantage

Relative advantage is regarded as the process whereby customers realises the benefits of a product or service based on its enhanced features and benefits rather than those of other substitutional computer software or hardware systems, such as, the use of advanced laptops rather than old-school devices such as type writers (Reichert & Zawislak, 2014; Maduku *et al.,* 2015; and Tagged, 2019). Relative advantage include; Customer Relationship Management Systems (CRMSs), Knowledge Management Systems, Sales and Marketing Systems, manufacturing and production systems, finance, accounting and links with HRM (Kehring, 2018; and Ann,

2019). Adopting EAA in SCM can lead to elative advantage by integrating different business strategies (Gerstein, 2012). Relative advantage it is advantageous if SMEs change the existing business models for the adoption of EAA (Rossi, 2014). DTI postulates five characteristics of innovation that affect diffusion, namely: relative advantage (the degree at which new IT provide more advantages to the existing tools); compatibility (its reliability with collective practices and norms among its users); complexity (its ease of use with processes); trialability (the opportunity to explore new technological systems(the actual adoption); and observability (depicts the positive side before the actual use) (Dillon & Morris, 1996a).

Sharing information across the Supply Chain compels SMEs to improve accuracy and reduce cost of orders at strategic, tactical and operational levels (Sewdass, 2012; and Reyes *et al.,* 2015). The relative advantage of using IT technology is that it allows the reach all types of systems and employees can give their inputs and suggestions (Endro *et al.,* 2017; and Sweeney, 2011). Relative advantage could lead to competitive advantage in SMEs with element of superiority in SCM.

2.7.5 Compatibility of Computer Systems

Compatibility of computer systems is referred to as the ability of electronic equipment and systems to function and perform with zero-defect together with electromechanical devices (Sebetci, Ö. 2019; Tong, K. 2019.). Compatibility of a technology entails the specific technical skills applied by architects with the responsibility for executing proper system operational activities with ease in SCM (Maerkedahl & Shi, 2014). With compatibility of computer systems documents can be easily stored and shared in different electronic mechanisms (Cedarville University, 2019). The internet is more compatible in Ethernet and optic fibre for network connectivity with protocols to control the waves through the transmissions of two or more systems that need a link to LAN, MAN and WAN (Kshetri, 2019). Compatibility could be perceived as an element of similarity with existing values, which depended on old systems that are possibly upgraded through the application software (De Oliveira & Peres, 2015; and Alshamari, 2016). System compatibility could be determined by the level of processor types that allows different data formats to meet all specifications from one system to the other, as such, the adoption of EAA would be simplified.

2.7.6 Customisability of EAA to the Enterprise and External Users

Customisability, in this study, is regarded as a process framing the operational activities that includes different system operation for different users in respect of network users; safeguarding data, sorting data for different aspects and automating networks (Barker, 2018). During the business processes on the adoption of EAA, it is key for SMEs to consider business strategies, such as, strategic market marketing planning, competitive strategies, strategies in the product life cycle, global strategies, relationship building strategies, brand strategies (Jooste *et al.,* 2018).

In some e-mail settings such as Yahoo! and Google, users are allowed to customise their web layout and background to closely match their preferences SMEs by adopting to EAA (Krishnaraju & Mathew, 2013; and Brandeisky, 2015). In a customer based EAA, the primary SMEs should have a clear understanding for customisability as a failure to understand terms and conditions by the initial producer of ready-made software could lead to legal issues such as infringement of privacy rights (Walcerz, 2019). Customisability of systems during the adoption of EAA would allow SMEs to choose software programmes that are economically viable.

2.7.7 Information Security

Information security is defined as the theories and practices that provide authorised user with the privilege and the right to use computer software for accessing classified information that requires high measures in accessibility (Delony, 2019). Biometric authentication is typically used to gain access on log-in to a system/service. This means that the rightful user is identified and recognised, but with an intruder, his or her data will be captured automatically and be sent to both the lawful user and the server administrator (Naser, 2018). Biological tracing such as fingerprint and face images, as well as biographic identification information that reflects surname; names; date of birth and place of birth, nationality and so forth, can be used in information security systems (Morosan, 2011; Efrati *et al.,* 2014; Maurer, 2018; and Marshall, Adebamowo, Ogundrian, Vekich, Strenski, Zhou, Mayhew, 2019). Biological tracing was developed to authenticate information about client's true-identity and the elimination of hacking (Jaiswal, Bhadauria & Jadon, 2011). Positive relationships with external financial institutions, such as financial donors and banks will assist in the

Actual Adoption of EAA in SCM (Ritchot, 2013; and Kirlidog & Kaynak, 2013). Biometric systems will provide secured access from when combined with gait cycle detection known as image detection, finger-print detection, voice-recognition and password encryption (Efrati *et al.,* 2014; Naser, 2018; and Mayhew, 2019). A weakness of the authentication systems is that they can be manipulated (Holden, 2010; and De Groot, 2014). Hacking is undertaken for a variety of reasons, such as the wish to damage a system or to understand how a system works (Quintia, 2019).

It is a requirement for SMEs to adopt smart EAA that take in account the security architecture to avoid cyber hacking (Ritchot, 2013). The system can be encrypted with user passwords for security verification by compounding it with biometric features (Asif *et al.,* 2017; and Brinkmann, 2019). The enterprise system is constructed to safeguard both internal and external users with regard to their privacy on their personal data (Filho & Aquino Júnior, 2015; and Ahmad & Mehmood, 2015). SMEs should, at least, magnify information security is to obstruct and identify hackers on computer system and internet, and to safeguard the SMEs data and information.

2.8 Perceived Attitude towards the Actual Adoption of EAA

In this section, relationships amongst Perceived Attitudes are determined on the Actual Adoption of EAA for SCM in SMEs are investigated. Attitude is classified as negative and positive attributes towards the actual adoption of EAA by complying with technological standards. Digital technology has transformed the livelihood of most business enterprises, with some setbacks (Anderson & Perrin, 2017). Perceived ease-of-use and perceived usefulness are key factors in the Actual Adoption of EAA (Kirlidog & Kaynak, 2013). Four variables, namely, Alternative User-Base Solutions, low Technological Aversion, vulnerability and resistance to change, are discussed to the next page.

2.8.1 Alternative User-Base Solutions

Sophisticated technological models and Application Software System (ASS) provide ready-made software for performing tasks such as on money transfer, debtors and creditors' control and on-line purchasing (Ismail, 2018). Throughout this study, the term Alternative User-Base Solutions refers to a process whereby IT could be used as

a technique of examining the enterprise solutions through fieldnames on the system that reveal all tracked documents being available in the computer or internet (Thomas, 2011). The use of an eye-detection scanner could be used as an alternative fora fingerprint detector and administrative login password to disguise all unauthorised users (Dascalescu, 2018; and Strom, 2018). In some instances, the greatest disadvantage in Alternative User-Base Solutions is that the sophistications in technology could be manipulated by hackers, thieves and intruders putting SMEs in risk.

2.8.2 Technological Aversion

Technological aversion manifest as a result of natural instinct as maximum acceptance to adopt EAA without determining beta-coefficient which is a relative measure of non-diversifiable risk (Malan, 2015; and Zhang, Brennan & Lo, 2014). Employees from South African Social Security Agency have objected the use of biometric technology due to complications that they encountered in setting-up the software. The upgrades in new versions will, at least, mitigate the risk of aversion (Horvitz, 2014). Security authentications will lead to admiration of classical economics that considers capital and intensive model that disadvantage labour intensive for full employment (Ghobakhloo *et al.,* 2011; and Nicolson, Huebner & Shipworth, 2018). SMEs could measure the level of sensitivity by considering the undiversifiable risk that would be inherent as a financial expenditure for the adoption of EAA.

2.8.3 Vulnerability and stochasticity

Securing the underlying data for users makes it possible amendments to change repository platforms in the future without losing any data (Oldewage, Engelbrecht & Wesley, 2019). The stochasticity involves biological or physical interactions such as iris, finger-print, face detection and voice-recognition (Székely &Burrage, 2014). Stochastic programming include models with random settings with discrete realisation being capable to create a strong decision-making framework in SCM (Domenica, Mitra & Birbilis, 2007). Well, in digital computers there is positive strong indication that stochastic behaviour can be tolerated in the adoption of EAA were systems are in place to increase SCM performance (Vasilaki & Allwood, 2018). SMEs could deal have appropriate approaches in SCM content to have a better inert-changing systems with

ease and comfort without tempering with the existing data or information (Szigligetius, 2019). For example, SEMs could be considered for data collection in relation with new competing product as a case study on how parameters of a stochastic individual-based model can be acknowledged from existing data and how the experimental model can be used to solve an optimal-control problem in a stochastic background (Parise, Lygeros & Ruess, 2015). However, a critical valuation on the importance of EAA in SCM is lacking (Zhou & Ning, 2017). A holistic approach is utilised, integrating Vulnerability and stochasticity to establish a safe environment for adopting EAA for SCM in SMEs.

2.8.4 Resistance to Change

Resistance to change is defined as a phase at which some employees do not see any need for a change and the level of conflict is massive with the possibility that the level of conflict will mobilise negative message to shift balance of power towards the adoption of EAA (Bolognese, 2018; Juneja, 2019; and Merritt, 2019). Resistance to change in this study is regarded as advanced digital revolution, such as EAA with digital transformation's role in security that provides better results (Merritt, 2019). The world is going through major technological changes. SMEs need to adapt and seek continuous improvement, not only to compete but to survive (Gonçalves, Pereira & da Gonçalves, 2012). Warning sign on active-resistance to change include seeing things in a negative light, such as, finding mistakes and fault, entertaining fear and manipulating the Actual Adoption of EAA as part of passive-resistance (Bolognese, 2018).

The application and implementation of suitable strategies could help to identify early manifestation of resistance to change by mitigating all cause effects for the Actual Adoption of EAA (Juneja, 2019). The core of resistance to change are the believe that change is unnecessary as it might make things worse, losing trust in employees leading the change, past low-success factors and the fear that the Actual Adoption of EAA could drain the capital of the organisation (Nguyen, 2010). SMEs should be in a good position to align change with organisational goals, determine any impacts, provide adequate communication strategies and training with the implementation of support structures and measure the change process linked with the adoption of EAA.

2.9 Actual Adoption of EAA

The relationship between perceived ease of use and the Actual Adoption of EAA focused on the following variables.

2.9.1 EAA Improves Job Performance of SCM

EAA provides empirical improvements depending on broad SMEs characteristics, employee perspectives and external business partners that reflects the benefits of adopting EAA for SCM integration (Abdullah, *et al.,* 2013). Long-term relationships between employer and employees increases the level of confidence and trust for shared values and mutual understanding on the adoption of EAA (Dyer *et al.,* 2015; and Esposito *et al.,* 2015). Absolute technological capability could assist SMEs to performance work interruptions resiliency reflected directly toward an improved understanding of employee effectiveness and efficiency that leads to productivity in SCM (Reichert & Zawislak, 2014; and Zide *et al.,* 2017).

SMEs commitment on improving the perception of obtaining great results on the adoption of EAA should be a priority (Porteous, 2014). By evaluating the functional performance and current IT aspects on electronic documentation system could help SMEs to improve its SCM activities (De Oliveira & Peres, 2015). The identification of the key drivers of ERP and evaluating its impacts on SCM performances could lead to a productive SCM (Mathaisel, 2013; and Hwang & Min, 2015). By developing an internal competitive strategies for adopting EAA could enhance job performance in SCM (Sewdass, 2012; and Zhang, Brennan & Lo, 2014). A value-added job enactment in SCM rely on the correct alignment of algorithms that integrates all functional departments within the SMEs.

2.9.2 EAA Provide Critical Support-Base for SCM

The critical support base in EAA include specific administration and analysis skills that could help in providing essential support on routine basis and crisis times (Asif *et al.,* 2017). Multiple communication technologies are used to adopt or facilitate EAA actual adoption so as to have a flexible and adaptable system for the entire enterprise, by encouraging and motivating employee participation (Kuehnhausen & Frost, 2011; King *et al.,* 2017; and Poirier, 2018). During the EAA actual adoption, the SMEs can use

mobile applications being linked with the computer software from different software technologies and architecture (Filho & Aquino Júnior, 2015). The system prototypes will include reverse engineering or integrating the old system with the new one and forward integration by implementing new process from scratch (Kuehnhausen & Frost, 2011). The major challenge are regarded as obsolescence in hardware and software that compels the SMEs to lease or hire equipment to keep up with the SCM complexities in categorization (Svärd, 2013; and Boykin, 2017). The information and communication technology need robust updates for viable enterprise operational-system in SCM (Poba-Nzaou *et al.,* 2014). The use of IT has brought a better communication and information dissemination to both internal and external stakeholders when there is effective communication and coordination of problems and decrease management control (Said *et al.,* 2013). A Critical Support-Base depends on SMEs' architectural design, design and key business drivers.

2.9.3 EAA Enhances SCM Activities

For EAA to enhance SCM activities, there should be integration of activities involved in the flow of materials and services focused on customer value creation (Banaeianjahromi & Smolander, 2016; and Gulati *et al*., 2018). EAA could enhance SCM based on enterprise manufacturing systems' tools such as ERP and MRP (Juneja, 2018). By planning demand forecasting with programmed EAA, flexibility will be experienced as a key factor to enabling a low-cost structure in SCM (Goldenberg & Dyson, 2018). SCM activities should be aligned with manufacturing department to reduce operational complexities through system collaboration (Mutoko & Kapund, 2017).

An efficient SCM approach need to be linked with a proper EAA to analyse the methodology and approach to manage the whole process (Kumar, 2000). Information processing will lead to a better way to analyse factors affecting the adoption of EAA on the possibility to enhance SCM activities and ultimately the business performance (Endro, Taher, Zainul & Nayati, 2017). EAA could upgrade SCM activities through designing strategic advantage; and creating a seamless operation by coordinating and integrating all activities and processes (Sangam, 2010; and Penaluna, Penaluna, Usei

& Griffiths, 2015). A systematic arrangement of EAA processes and design could make SCM activities more simplified for SMEs.

2.9.4 EAA Improves Activities for SCM

EAA compels enterprises to have a conceptual work allocations per specialisation so that activities are eased by using electronic systems to documenting, editing, sending and retrieving for SCM (Fenech, 2018). Digital filing email messages can make filing important information easier, safer and less expensive for SCM (Desmet, Maerkedahl & Shi, 2014*;* and Root III, 2018). Electronical documentation provide SMEs with the opportunity to duplicate, send and receive documents within short space of times (De Oliveira & Peres, 2015). EAA could allow the SMEs to manage activities with a high-performing standards (Lawrence, 2017). EAA could legitimate the workplace-based activities for SMEs through programming in SMEs (Chen, 2014). EAA ease end-user satisfaction through technology compatibility within the enterprise by assessing core Information System Components that leads to ease of SCM activities (Sebetci, 2019).

It enhances the strategic and tactical planning, firstly by proposing a competitive intelligence framework for both internal and external users aligned per departments for specialisation in SCM (Sewdass, 2012). It focuses on end-user satisfaction on well specified activities through technological compatibility and allocating all SC activities within the EAA (Karim, 2011). It makes suggestions on proposing a competitive intelligence framework for SCM activities for enhancing enterprise productivity to maximum level (Sebetci, 2019). The ease of SCM in SME activities depends on the structural development for EAA through digital work processes that will operate at ease for their routine business activities.

2.9.5 Supply Chain World: Supply Chain Optimisation

EAA ease work-flow system in SMEs for SCM should be able to face challenges such as; distribution network configuration, flexibility for access, number of participants, geographical allocation, suppliers networks, production facilities, distribution centres, warehouses, customers relations and distribution strategies (Nair, 2010; and Stet, 2014). Little attention has been paid to the capabilities of EAA systems and the degree to which ECs actually utilise them for SCM (Holden, 2010). The use of transmission

media from different geographic locations compels SMEs to make use of computers, telephones and wireless devices with the use of networks such as LAM, MAN and WAN making the adoption of EAA possible (Dias, 2016; Vatsa; 2010; Arisar, 2016; and Matin & Islam, 2012). The Data Communication Model highlights important variables such as; sender, protocol communication, transmission media, messages and the receiver in the Actual Adoption of EAA (Beal, 2018b). A suitable EAA structural system would lead to productive SCM work optimisation that will lead to SME value creation through customer retention.

2.9.6 Technological intransigence or inflexibility

Information technology is dependent on comprehensive flexibility within the enterprise and its external stakeholders on the lime-light between lack of compatibility from different software application systems that could have difficulties in enhancing sending and receiving of different purchases request forms (Han, Wang & Naim, 2018). To advanced enterprises information technology flexibility has yielded positive results aligning sustainability with competitive advantage in all transactional processing (Ness, 2008; Vogt, 2015). Flexibility technologies could ease the use of manual recordkeeping with the use of programmed order forms (Goldenberg & Dyson, 2018).

A well-regulated computer system could design a flexible architecture model that is based on efficiency and effectiveness in all input-requirements in SCM (Bawa, Buchholz, de Villiers, J. Corless, & Kaliner, 2017). For enterprises to have flexible working environment, reasonable computer systems should be in-place with flexible work interchange (Sanders, Zeng, Hellicar & Fagg, 2016). Flexibility could be used to strengthen the business relationships between different suppliers, distributors, wholesalers and retails stores (Pereira, Sellitto, & Borchardt, 2018).

2.10 The Conceptual Research Model

The conceptual model illustrates the relationships between the independent variables Actual Adoption of EAA for SCM, the researcher developed the conceptual research model, illustrated in Figure 1. The following variables are discussed; internal factors, external factors, perceived attitude towards the Actual Adoption of EAA and Actual Adoption of EAA for SCM in SMEs. The concepts EAA in SCM has been rapidly

emerging in all sectors of the economy where the 4th Industrial Revolution took corporate businesses with a storm (Anderson & Perrin, 2017; and Nickolaisen, 2018). Over the last few years, an interest in social entrepreneurship continues to grow (Johnson, 2000; and Nicholls, 2008). Social entrepreneurship has become a global phenomenon that impacts the society by employing innovative approaches to solve social problems (Robinson, 2015).

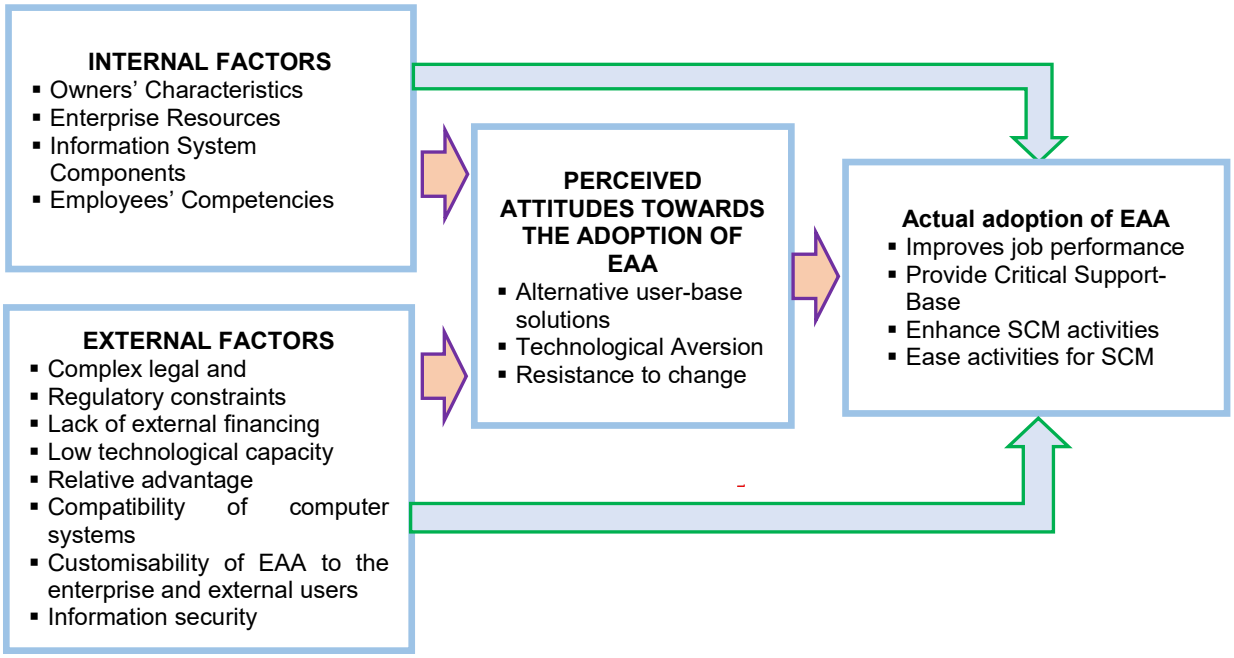


Figure 1.1: The Conceptual Research Model
Source: Author Conceptualisation

There is considerable interest in the 4th Industrial Revolution, hence there are some barriers, such as, low Technological Aversion; vulnerability and stochasticity; and resistance to change (Israelstam, 2015; and Szigligetius, 2019). However, EAA means the Actual Adoption of EAA to many SMEs with different demands for certain motives in fulfilling SCM activities (Zahra *et al.*, 2008). The model is designed to ease the misunderstandings about the Actual Adoption of EAA for SCM in SMEs. A systematic arrangement of all variables, such as, internal factors, external factors, Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA were discussed. Information System Components need to be purchased with a thorough understanding of their functionality, especially for computerised data on software systems (Claidio, 2016; and Sharma, 2018b).

2.11 Conclusion

This chapter presented what other authors have established on what EAA is and how it could affect SCM within SMEs. The definition of SMEs, contributions of SMES to the South African economy and challenges encountered by SMEs were discussed. The theoretical framework covers four theories concepts, namely, TAM, DTI, TRA and TPB. The definitions, contributions of SMES to the South African economy and challenges faced by SMEs are also discussed. The relevance of theoretical framework is supported by the conceptual research model. The following chapter will be focusing on the research methodology.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter was to outline the Research Design, research area and population, sampling method, sample size, data collection, data analysis, reliability, validity and objectivity, as well as the preparation involved in conducting this research. Research methodology was regarded as a systematic way used to solve a specific enterprise problem. As a result, it was treated as a science of studying how research was to be carried out (Myers, 2019). Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology (Bryman, 2012; and Dudovskiy, 2016).

This chapter provided a detailed discussion about the methods and procedures that were used. Research techniques referred to various instruments or tools that were used to collect and analyse data (Creswell & Creswell, 2017). Three methods of research methodology, namely; qualitative, quantitative and trianquliation of methodologies, are commonly used in research, based on the nature of the study (Durcevic, 2020). For this study, a quantitative method was applied and classified based on the nature of data collection sources (Creswell & Creswell, 2017).

3.2 Research Design

Categories on research philosophical approaches ranged from positivism to the qualitative study of phenomenon (Salkind, 2012; Creswell, 2013; McMillan & Schumacher, 2014; Gaille, 2018; Ittana, 2018; and Cloud, 2019). A positivist Research Design was chosen based on a cross-sectional survey that allowed the researcher to explore the research objectives through the collection that let to ease on analysis of primary data. Research Design was considered as the masterplan based on a fundamental method of data collected through questionnaires, interviews, surveys, archival research, observations, and a single combination of these methods (Riezebos, 2017). In this study, the researcher utilised a descriptive model to obtain the primary data (Hennessy & Patterson, 2012; and Anderson, *et al.,* 2013).

The advantage for using the descriptive model is that it is able to describe relationships between internal and external factors and Perceived Attitudes towards the Adoption of EAA. The quantitative approach was adopted as the research required the testing of relationships. Quantitative research was considered as a positivistic approach where data were used to describe and measure all variables (Anderson, *et al.,* 2013; and Wegner 2015). The benefit of using quantitative research was based on the conception that it focused on techniques that required comprehensive and complete data that were collected. Five categories on research philosophical approaches such as, positivism paradigm, interpretivism paradigm, epidome of pragmatism, critical realism and postmodernism, were discussed (Salkind, 2012; Creswell, 2013; McMillan & Schumacher, 2014; Gaille, 2018; Ittana, 2018; and Cloud, 2019).

A positivist Research Design was chosen based on its natural instincts that granted experimental and field survey that granted the researcher an opportunity to explore the research objectives and the collection of primary data. Descriptive research provided a competitive advantage for designing a distinctive profile per variables, procedures and situations (Saunders, Lewis & Thornhil, 2012). The descriptive research was selected as one few variables that included; sample population, range, minimum, maximum, mean, standard deviation (σ) and variance.

3.3 The Research Process

The research process was defined as scientific research involves a systematic process that focuses on being objective and gathering a multitude of information for analysis so that the researcher can come to a conclusion. This process was used in all research and evaluation projects, regardless of the research method known as scientific method of inquiry, evaluation research or action research. The researcher followed a thorough and systematic steps in sampling the population by identified the population that was representation for all SMEs in CDM. The sampling frame included both enterprise owners and managers as the respondents that wished to collect data from. The sampling method included three categories, namely, Simple Random Sampling, Stratified Sampling and Cluster Sampling of which the researcher considered Stratified Random Sampling.

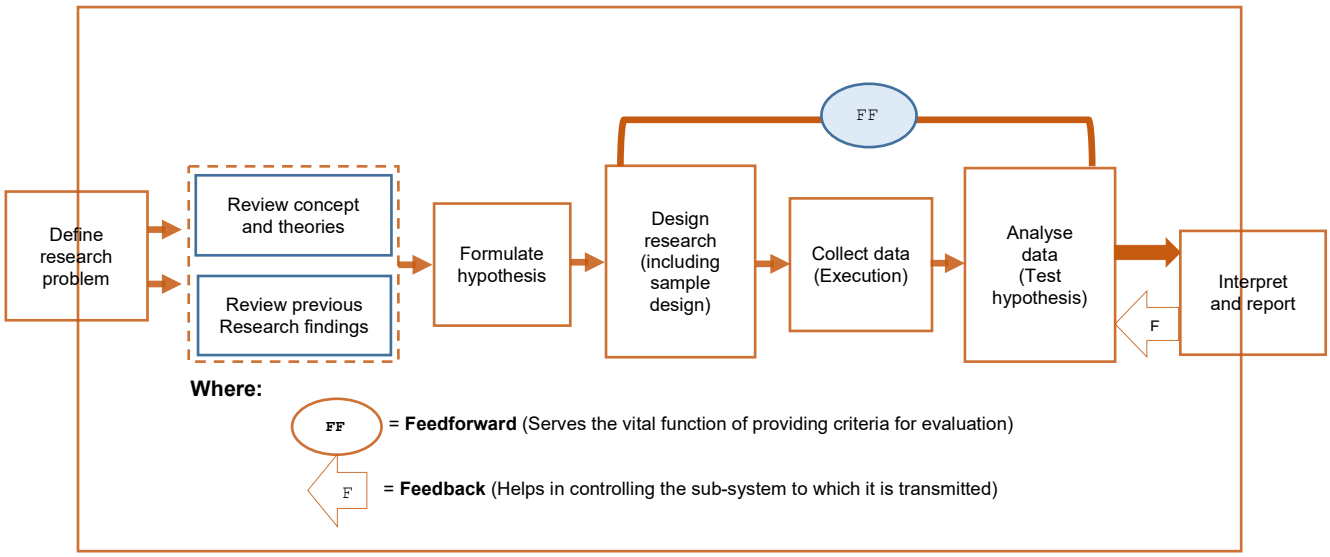


Figure 3.1: The Research Process
Source: Kadam, 2018

- Step 1: Define the research problem

The research gap identified was that both the internal and external factors influenced the Actual Adoption of EAA for SCM in SMEs.

- Step 2: Review concepts and theories

EAA concepts included enterprise interactions with suppliers, processes and enterprise systems, customers and distributors; SCM system; Customer Relationship Management Systems; Knowledge Management Systems, sales and

marketing; manufacturing and production; finance and accounting; and link with Human Resources Management. Three theories were scrutinised and discussed, namely, Diffusion Theory of Innovation (DTI) and its limitations; Theory of Reasoned Action (TRA); and Theory of Planned Behaviour (TPB).

▪ Step 3: Review previous research findings

Previous literature review provided insight in structuring the research problem statement and focused on internal and external factors affecting the Actual Adoption of EAA for SCM in SMEs.

▪ Step 4: Formulate the hypotheses

Five hypotheses were formulated after structuring the research objectives that included internal factors with three sub-hypotheses external factors, Perceived Attitudes towards the Actual Adoption of EAA and Actual Adoption of EAA.

▪ Step 5: Research Design

The Research Design was considered to be quantitative method as a descriptive research were the population was identified, sample was identified as 310 SMEs and where data were collected from.

▪ Step 6: Collection of data

Data was collected in the form of questionnaire survey in SMEs located in CDM that included7; Blouberg (Bochum) Municipality, Molemole (Dendron) Municipality, Polokwane Municipality and Lepelle-Nkumbi (Lebowakgomo) Municipality (Administrative Divisions of South Africa, 2018

▪ Step 7: Analyse data

Tests were used to determine the distribution of data of the populations from which the samples were drawn and both the Cronbach's Alpha and Kolmogorov-Smirnov test were used to determine the reliability and validity of data. At a latter stage, data analysis was concluded through the use of descriptive statistics on Pearson Correlation Coefficients, ANOVA, Pearson's coefficients and for testing the hypotheses (Kim, 2014; Shrivastava, 2019). Furthermore, the simple Linear

Regression Model was used to measure linear relationship between variables that projected either a negative or positive slope.

- Step 8: Clarify the Problem

The main problem was identified in Step 1, although the problem was complex and unavoidable with certain limitations that they were inflexible and linked to traditional forms of investigation.

- Step 9: Interpret and report the results

The interpretation of the results was done in Chapter 4, whereas the reporting of the results was conducted in Chapter 5 in the form of summary findings, conclusions and recommendations.

3.4 Research Philosophy

Research philosophy was regarded as a systematic prearrangement of assumptions based on of beliefs and progression on knowledge from dynamic and dramatics of new theory derived from human motivation for producing solutions through the adoption of EAA for SCM within SMEs (O'Gorman & MacIntosh, 2015; and Sharrock & Button, 2016). In the history of research philosophy, several assumptions were made such as epistemological assumptions known as human knowledge; ontological assumptions denoted to realisms encountered by the researcher; and axiological assumptions signified to a magnitude where certain values influenced the research process (Thorne, 2016; and Kadam, 2018). The research philosophies were discussed below.

3.4.1 Positivism Paradigm

The French philosopher, August Comte, postulated positivism as a pattern was based on the philosophical ideas referred to empiricism of positive knowledge, observation through confirmed and substantiated data with natural phenomena that used scientific methods and their properties and relations on positive facts, interpreted through reasons and logical observation as empirical evidence (Boyd, 2019; and Crossman, 2019). A positivistic approach lead to the understanding of human behavioural patterns as an approach to the adoption of EAA for SCM (Rosenberg, 2011; and

Rafeedalie, 2019). For a credible and meaningful data, epistemologically the researcher focused on discovering apparent and measurable facts leading to the adoption or rejection of EAA for SCM (Thorne, 2016; and Hughes & Sharrock, 2016). In Sociology, there were two basic approaches to research known as: positivism, which considers scientific quantitative methods; and interpretivism, which considers humanistic qualitative methods (Thompson, 2015a).

In positivism research, positivists prefer quantitative methods such as social surveys, structured questionnaires and official statistical analysis as they guaranteed good reliability and representativeness (Jansen, 2010). Furthermore, positivists perceive society on the notion that social facts shape individual actions, and such provides the advantage of conducting quantitative research on large-scale surveys in order to get an overview of society or population as a whole and to uncover social trends, such as the relationship between EAA and SCM known as a comparative method (Anayet & Ali, 2014). In natural phenomena, the researcher adopted an extreme positivist position, as evident in data collection where enterprises were treated and managed as physical substances for data collection.

3.4.2 Interpretivism Paradigm/Constructivist Paradigm

Interpretivism was used to group together diverse approaches in research that included; social constructivism, phenomenology and hermeneutics approaches. Interpretivist paradigm was assigned within the structure of the domain for self-sufficiently consciousness, which was associated with the philosophical situation of optimism (Kivunja & Kuyini, 2017). Interpretivism emphasised that humans are different from physical singularities as they create meanings to any situation (Dudovskiy, 2019).

Interpretivism argued that human beings and their social worlds cannot be studied in the same way as physical phenomena, and that social sciences research needed to be different from natural sciences research rather than trying to emulate the previous research results (Rosenberg, 2011). The purpose of interpretivist research was to create new, rich understandings and interpretations of social worlds and contexts (O'Gorman & MacIntosh, 2015). Interpretivism denoted that individuals were

sophisticated with complex different personalities and experience that lead them to have objective reality' in very different ways, thus signify that scientific methods were not appropriate (Bernabe, Van Thiel, Raaijmakers & Van Delden, 2012).

3.4.3 Epidome of Pragmatism

Epidome of pragmatism was reflected as a general view-point that strengthened mixed methods in research such as; methodological triangulation for addressing the problem-oriented philosophy that verified the research hypotheses (Kivunja & Kuyini, 2017; and Saeed, 2018). Pragmatism declared that research concepts or terminologies were relevant for the study thorough understanding and flow of information that served as an interpretation of difficult terminologies (Sharrock & Button, 2016). It attempted to reconcile both objectivism and subjectivism with facts and values that leads to accurate understanding of different contextualised experiences.

3.4.4 Critical Realism

Epistemologically, critical realism was considered as a philosophy of scientific knowledge based on the grounds of having the relations between the concepts and categories in a subject area or domain, grounded in theoretical explanations about phenomena, which operated the same way as positivism and interpretivism (Lyubimov, 2015; and Kivunja & Kuyini, 2017). In the late twentieth, critical realism was developed as an approach that occupies a middle ground between two positions, such as on positivism and interpretivism standards (Cloud, 2019). Critical realism functioned and depended on tangible evidence and involvement practices for mastering the fundamental underlying structures of reality that constructed the observed events (Kent & Tsang, 2010). In epistemological relativism, secondary and tertiary information were used to respond to social constructions and phenomena (Hoghes & Sharrock, 2016).

3.4.5 Postmodernism

Postmodernism highlights answered for enquiry being acknowledged as a way of rational thinking that provided a voice to alternative side-lined views based on the role of language and of power relations (Kent & Tsang, 2010; and Sharrock & Button, 2016). Postmodernism was historically entangled with the intellectual movement of

poststructuralism. Postmodernists went even further than interpretivists in their critique of positivism and objectivism, attributing even much importance to the role of language (Martínez, 2017; and Campbell, 2018). In postmodernism, a modern objectivist was rejected based on realist ontology of things that emphasised the chaotic primacy as a result of change such as in the context of industrial revolution (O'Gorman & MacIntosh, 2015). Overall, the philosophical foundation was focused on identifying relevant Information System Components for the adoption of EAA as they are in need of customised SCM activities within SMEs (Mkansi & Acheampong, 2012). For this reason, interpretivism was chosen as it permitted the acceptance or rejection of EAA for SCM by grouping together diverse approaches trough the exploration of constructs, such as, internal and external factors, Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA.

3.5 Study Area

The study area was considered as a comprehensive description for specified geographical locations that includes economical, socio-democratic, physical environment and natural resource characteristics of the field environment (Mutopo,

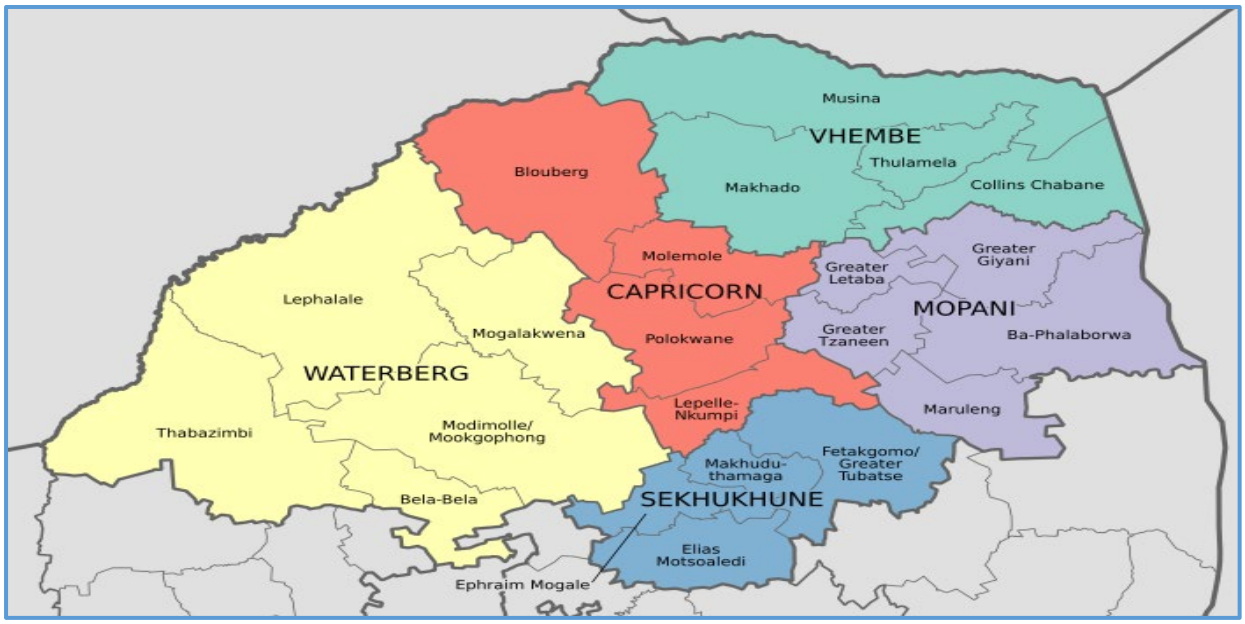


Figure: 3.2 List of Municipalities in Limpopo
Source: Administrative Divisions of South Africa, 2018

2016). The research area was focussed on SMEs in the CDM located in Limpopo Province, of South Africa. Thus, this provided the researcher with a simplified

availability of a sufficient number of SMEs to gather data.The above figure demonstrates municipalities per districts and, in this regard, the focus area is CDM. Data were collected from those designated areas.

3.6 Population of the Study

The research population is considered as the diverse group of individuals to whom the researcher intended to generalise the results for the study (David, 2019). The population included all registered SMEs in the CDM of the Limpopo Province of South Africa. The target population was represented by either the owner's or management of the enterprise. The SMEs population in Limpopo Province was 1900 as per the record from Small Enterprise Development Agency (Small Enterprise Development Agency, 2019b).

3.7 Methods/Instruments/Techniques Used to Collect the Data

The methodological approach used in this study for collection of data reserved its ability to perform a comprehensive analysis of the results after the completion of the interpretation of the results (Salthouse, 2011). A thorough check was done by eliminating and excluding certain questions in a survey that were irrelevant for the study. Nevertheless, a pilot study was conducted and occurrences were eliminated from the actual survey. In some cases wherein analytical methods are problematic or had implications on developmental phenomenon based upon results of the methods, such were changed.

A literature on theoretical and methodological watchfulness in scale was development extensively as some limitations have been identified in the process. These include failure to adequately define the geographical area and for incorrectly specifying the measurement model, even underutilisation of some techniques that were helpful in establishing construct validity (Morgado, Julia, Meireles, Neves, Amaral & Ferreira, 2017).

3.8 Sample and Sampling Methods

3.8.1. Sampling Methods

Sampling methods explicate the way at which the members were selected from the population to be in the study (Khan Academy, 2013).

3.8.2.1 Probability Sampling

The researcher considered a Probability Sampling for randomisation and took steps to ensure all members of a population have an equal chance of being selected. The challenges in using Probability Sampling were that, there was a need for additional information as accumulated from chapter 2 via literature review in responding to questions and on the other hand it was complex and time-consuming (Lombardo, 2018);

- In Stratified Sampling the population was divided into sub-groups known as strata and they were randomly selected from each stratum groups. Its core focus was to ensure that all required groups were fully presented (Gerrish & Lathlean, 2015; and Murphy, 2018);
- Systematic sampling was used for a specific system to select members such as every third person on an alphabetic order (Jackson, 2018). It is more advantageous approach with low risk and easily controllable (Ross, 2018). Its drawback is that the requirement that the population is uniform may not always be realistic (Devkota, 2018);
- Cluster Random Sampling entailed that population was grouped together and divided into clusters and regarded as samples (Ochoa, 2017);
- Multi-Stage Random Sampling included the combination of one or more of the above methods (Gove, Ducey & Valentine, 2002). In general, it is less efficient than a suitable single-stage Random Sampling (Azad, 2018); and
- Cluster Sampling reduced the process of variability and was applied with feasible approach as it was applied to multiple areas within the CDM (Verial, 2018; and Gaille, 2018). Its benefits are that it was relatively easy to manage fast and it is more cost-effective (Foley, 2018c).

3.8.2.2 Non-Probability Sampling

A non-probability sampling methods was considered as an acceptable alternative as control studies in clinical trials for evaluation research designs that divert surveys and for opt-in panels that were not explored in detail by survey researchers in other applied research fields (Baker, Brick, Bates, Battaglia, Couper, Dever, Gile & Tourangeau, 2013). The Non-Probability Sampling does not depend on the use of randomisation techniques to select members. This was typically used in studies where randomisation is not possible. The level of biasness is more of a concern with this type of sampling. The different types of Non-Probability Sampling are as follows:

- Convenience or Accidental Sampling – The convenience sampling denotes a platform whereby participants are selected based on their availability (Stephane, 2014);
- Purposive Sampling – The purposive sampling signifies a point where respondents are purposefully selected (Foley, 2018);
- Modal Instance Sampling – The modal instance sampling was considered as an important factor used to plan new programs such as EAA in SCM (Staphane, 2014);
- Expert Sampling – In expert sampling it is regarded as a situation wherein respondents are selected for their knowledge about a subject (Palinkas, Horwitz, Green, Wisdom, Duan & Hoagwood, 2016);
- Proportional and Non-Proportional Quota Sampling – In case for both proportional and non-proportional quota sampling participants are sampled until exact proportions of certain types of data were obtained, with sufficient data in different categories collected (Sedgwick, 2013);
- Diversity Sampling – In diversity sampling the respondents are selected intentionally across possible types of responses, so as to capture all possibilities (Allmark, 2004); and
- Snowball Sampling – In this regard the snowball sampling the respondents are sampled and asked to help identify other members to sample and the process continued until enough samples are collected (Devkota, 2018).

3.9 Sample Method Used, Sample Selection and Sample Size

Sample is defined as a fraction of the entire population, where data were selected and collected from a large population for measurement (Johnson, Turner & Christensen, 2011; and Omair, 2012). The researcher used Stratified Random Sampling to draw. The sample size was calculated as thus;

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{1900}{1 + 1900(0.05)^2}$$

$$n = \frac{1900}{1 + 1900(0.0025)}$$

$$n = \frac{1900}{1 + 4.75}$$

$$n = \frac{1900}{5.75}$$

$$n = 330$$

(Leedy & Ormrod, 2014)

Table 3.1 n-Calculation Variables

Where;	N = Population	1900
	E = Precision	0.05
	n = Number	310

Source: Author Conceptualisation

Hence conclusions are made about entire population of SMEs in CDM. Stratification was based on the percentages of the SMEs in each area. Stratified Sampling was used to ensure that each area was proportionally represented in the sample. In each area, the sample was drawn using random numbers to ensure that the results could be used as representative of the whole population in each area. In the SMEs, enterprise owners/managers were selected. Yamane's (1967:886) formula was utilised to calculate the sample size of this study (Agrasuta, 2013; and Ladner, 2018). The researcher used Stratified Random Sampling to draw conclusions about entire population of SMEs in CDM. Stratification were based on the percentages of the SMEs in each area (Leedy & Ormrod, 2014).

3.10 The Research Instrument Construction

3.10.1 The Research Instrument

A research instrument is a tool used for measuring dependent and independent variables. The questionnaire was tested in a pilot study and few amendments were made (National Academy of Sciences Engineering Medicine, 2009). The following main variables were tested; internal factors, external factors, Perceived Attitudes towards the Adoption of EAA have been measured towards the Actual Adoption of EAA.

3.10.2 Questionnaire Construction

The primary data were collected by using self-administered questionnaires, structured in a Likert Scale or cross-table are formalised for the response rate with specified ratings, wherein the respondents tick a favourable and that gave the researcher a flexible amble opportunity to stratify the response rates (Saunders, *et al.,* 2012; and Chauri & Grønhaug, 2010). Likert scale was considered as a psychometric scale with set of options for the respondednts to express their interpretations, opinions and thoughts based on projected sitiation. Likert-scale questionnaires allow researchers to collect large amount of data with relative ease (Nemoto & Beglar, 2014). The rating scales was from 1 – 5, and being represented as follows; 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree and 5 = Strongly Agree.

Secondary data were considered as primary data collected by other researchers; hence, in reality, it is regarded as historical data being analysed. A tertiary data represented summaries or condensed versions of materials that referenced back to both primary and/or secondary sources (Repplinger, 2015; and Elsoudy, 2016). Afterwards, the pilot study conduct and all unnecessary errors and biased questions were highlighted and corrected. Follow-ups were completed to increase the response rate. The questionnaire was developed in line with the research objectives and hypotheses. The table below exemplifies all hypotheses with reference to the concepts as discussed in the literature review. The following constructs in line with research objectives were discussed.

Sub-hypotheses:

Table 3.2: Sub-Ha1.1: Owners' Characteristics

THERE IS A POSITIVE RELATIONSHIP BETWEEN INTERNAL FACTORS (OWNER'S CHARECTARISTICS) AND PERCEIVED ATTITUDES TOWARDS THE ADOPTION OF EAA FOR SCM IN SMES.		
NO:	**OWNER'S CHARACTARISTICS**	**REFERENCE**
1.1)	Demonstrate passion for being successful with the business.	Alziari, 2017
1.2)	Try out new ideas in the business.	Warr, 2018
1.3)	Set goals and guidelines to achieve them.	Sarri *et al.,* 2010
1.4)	Demonstrate passion for hard-work.	Sarri *et al.,* 2010
1.5)	Ignore distractions and focus on the immediate challenges.	Stok, 2018
1.6)	Demonstrate "fight back" when problems threaten.	Seth, 2017a

Source: Author Conceptualisation

Table 3.3: Sub-Ha1.2: Enterprise Resources

THERE IS A POSITIVE RELATIONSHIP BETWEEN INTERNAL FACTORS (ENTERPRISE RESOURCES) AND PERCEIVED ATTITUDES TOWARDS THE ADOPTION OF EAA FOR SCM IN SMES.		
NO:	**ENTERPRISE RESOURCES**	**REFERENCE**
2.1)	The enterprise have sufficient Financial Resources to adopt new technologies.	Hillstrom, 2018
2.2)	The enterprise have enough human resources to adopt new technologies.	Ross, 2018
2.3)	The enterprise have mainframe computers to adopt new technologies.	Thakur, 2018
2.4)	The enterprise have personal computers to adopt new technologies.	Ellis, 2017
2.5)	The enterprise have computer hardware to share information accordingly.	Ticlo, 2018
2.6)	The enterprise have expert back-up plan on new technologies.	Coté, 2016

Source: Author Conceptualisation

Table 3.4: Sub-Ha1.3: Information System Components

THERE IS A POSITIVE RELATIONSHIP BETWEEN INTERNAL FACTORS (INFORMATION SYSTEM COMPONENTS) AND PERCEIVED ATTITUDES TOWARDS THE ADOPTION OF EAA FOR SCM IN SMES.		
NO:	**INFORMATION SYSTEM COMPONENTS**	**REFERENCE**
3.1)	Does the enterprise have a way of making payment on-line?	Zwass, 2018
3.2)	Do the enterprise have way of managing information on-line?	Zandbergen, 2018b
3.3)	Do the enterprise have information controlling measures?	Hamlett, 2018
3.4)	Do the enterprise have a system that support their decisions?	Beal, 2018b
3.5)	Do the enterprise have the system that support the owner's duties?	Kim *et al.,* 2016
3.6)	Do the enterprise have knowledge about information systems?	Birkett, 2018
3.7)	Do the enterprise use internet and network connectivity?	Heakal, 2018

Source: Author Conceptualisation

Sub-hypotheses continues….

Table 3.5: Sub-Ha1.4: Employees' Competencies

THERE IS A POSITIVE RELATIONSHIP BETWEEN INTERNAL FACTORS (EMPLOYEES' COMPETENCIES) AND PERCEIVED ATTITUDES TOWARDS THE ADOPTION OF EAA FOR SCM IN SMES.		
NO:	**EMPLOYEES' COMPETENCIES**	**REFERENCE**
4.1)	Do the employee have the skills for using the internet?	Roma, 2018
4.2)	Do the employees have the ability for creating and formulating word documents?	Leonard, 2018
4.3)	Do the employees have the ability to use tables and columns?	Atlassian, 2018
4.4)	Do the employee have the ability for using spreadsheets and merging documents?	Branscombe, 2018
4.5)	Do the employees have communication skills for dealing with customers?	Stok, 2018
4.6)	Do the employees have network channel with suppliers and customers?	Hillstrom, 2018
4.7)	Does the enterprise control its website information?	Ticlo, 2018
4.8.)	Does the enterprise manage its administration files on-line?	Lawrence,2017
4.9)	Does the enterprise manage its information resources?	Richards, 2018
4.10)	Does the enterprise manage its resources as planned?	Butterfield, 2017

Source: Author Conceptualisation

Table 3.6: Ha2: External factors

THERE IS A POSITIVE RELATIONSHIP BETWEEN EXTERNAL FACTORS AND PERCEIVED ATTITUDES TOWARDS ADOPTION OF EAA FOR SCM IN SMES.		
NO:	**EXTERNAL FACTORS**	**REFERENCE**
5.1)	Legal constraints hinder the use of new hardware and software in my business.	Walcerz, 2019
5.2)	Lack of external financing impact the adoption of Information Technology.	Rossi, 2014
5.3)	Low technological accessibility impact the adoption of Information Technology.	Wayner, 2019
5.4)	Information Technology lead to unfair advantage within the market.	Ann, 2019
5.5)	Difficult requirements in technological environment affect the adoption of Information Technology.	Mulder, 2012
5.6)	Compatibility with external computers affect business activities.	Jahani, 2010
5.7)	Information Technology expose the enterprise to information theft.	Maurer, 2018

Source: Author Conceptualisation

Table 3.7: Ha3: Perceived Attitudes on the Adoption of EAA

THERE IS A POSITIVE RELATIONSHIP BETWEEN PERCEIVED ATTITUDES AND ACTUAL ADOPTION OF EAA FOR SCM IN SMES		
NO:	**PERCEIVED ATTITUDES ON THE ADOPTION OF EAA**	**REFERENCE**
6.1)	I sometime use old work procedures to process my daily activities.	Grossman, 2018
6.2)	I dislike technological processes.	Malan, 2015
6.3)	My work is not secured when I use Information Technology.	Strom, 2018
6.4)	I only use technology under supervision.	Russel, 2013

Source: Author Conceptualisation

Hypotheses continues….

Table 3.8: Ha4: Actual Adoption of EAA

THERE IS A POSITIVE RELATIONSHIP BETWEEN EXTERNAL FACTORS AND ACTUAL ADOPTION OF EAA FOR SCM IN SMES		
NO:	**ACTUAL ADOPTION OF EAA**	**REFERENCE**
7.1)	Information Technology simplify my day-to-day activities.	Priyankara, 2015
7.2)	Information Technology highlight technical errors for me.	King *et al.,* 2017
7.3)	It makes work flow straightforward.	Poirier, 2018
7.4)	Information Technology improves my job satisfaction.	Root III, 2018
7.5)	Information Technology support all aspect of my job requirement.	Walsh & House, 2019
7.6)	Information Technology allows me to accomplish more work than in manual process.	Nair, 2010

Source: Author Conceptualisation

3.11 Pilot Study

A pilot study refers to an initial test of the questionnaire for whether it is feasible or non-feasible as a measurable procedure by using participants who closely resemble the targeted study population (Salkind, 2010; and Shuttleworth, 2010). A pilot study was carried-out before hand on the actual distribution of questionnaire in CDM from SMEs. The purpose of this approach was to determine whether respondents find any difficulties with any possible ambiguous question (Flom, 2013). In this study, the researcher adopted a pilot study with the sole purpose of detecting possible mistakes in the measurement procedures, by mixing questions from different sections of the hypotheses being tested (Manning & Robertson, 2015). A pilot study is considered for randomisation and finding an appropriate execution of respondents' understanding (Anesthesiol, 2017). The following questions were amended after conducting a pilot study;

Demographic factors

From	Please tick an appropriate box (✓) from 1.1 to 1.6
To	Please indicate your agreement with the following statements about the demographic characteristics of the owner's and mangers towards the adoption of new information systems such as enterprise application architecture?

Owner's characteristics

From	Please indicate the owner's characteristics towards the use of information technology for the adoption of enterprise application architecture in the business.
To	Please indicate your agreement with the following statements about owner's characteristics.

Enterprise resources

From	Please indicate your agreement with the following statements about the resources of your enterprise towards the use of information technology for the adoption of enterprise application architecture for supply chain management.
To	Please indicate your agreement with the following statements about the enterprise resources for new information systems such as enterprise application architecture* (See bottom page).

Information technology components

From	What is the level of availability for the following information systems components in the enterprise towards the adoption of enterprise application architecture for supply chain management.
To	Please indicate your agreement with the following statements about the information system components of your enterprise for new information systems such as enterprise application architecture* (See bottom page).

Employees competencies

From	Does the employees and managers possess the following competencies in information technology towards the adoption of enterprise application architecture for supply chain management?
To	**To:** Does the employees and managers possess the following competencies for new information systems such as enterprise application architecture* (See bottom page)?

External factors

From	Please indicate your agreement with the following statements from external factors for supply chain management in use of information technology towards the adoption of enterprise application architecture.
To	Please indicate your agreement with the following statements on the external factors on new information systems such as enterprise application architecture* (See bottom page).

Perceived attitudes towards the adoption of enterprise application architecture

From	Please indicate your agreement with the following statements for perceived attitudes in information technology for supply chain management towards the adoption of enterprise application architecture.
To	Please indicate your agreement with the following statements for perceived attitudes towards the use of new information technology such as enterprise application architecture* (See bottom page).

From intention to use information technology to actual adoption of enterprise application architecture

From	Please indicate your agreement with the following statements on the intention to use information technology for supply chain management towards the adoption of enterprise application architecture?
To	Please indicate your agreement with the following statements on the intention to use new information systems such as enterprise application architecture* (See bottom page).

3.12 Data Analysis and Presentation

The data are clearly presented in tables, figures and graphs in Chapter 4. The Statistical Package of Social Science (SPSS) version 25 was used to provide the tables, graphs and figures for frequencies histograms, averages and σ, and to portray the statistical relationships that were calculated (Chauri & Grønhaug, 2010).

3.13 Reliability, Validity and Objectivity

3.13.1 Reliability of the Study

Reliability refers to the extent to which items in a questionnaire exhibited consistency on the phenomenon it is measuring (Pallant, 2013). The Cronbach's Alpha was used as a measure for reliability of the research hypotheses based on its flexibility where it was computed using software and software system, and it required only one sample of data to estimate the internal consistency on reliability (Koushik, 2013).

Table 3.9: Cronbach's Alpha per Construct

ITEM-TOTAL STATISTICS	
Variables	**Cronbach's Alpha**
Owners' Characteristics	0,880
Enterprise Resources	0,874
Information System Components	0,876
Employees' Competencies	0,878
External factors	0,882
Perceived Attitudes towards the Adoption of EAA	0,893
Actual Adoption of EAA	0,880

Source: Author Conceptualisation

The coefficient was rated to a minimum of 0.70 which is recognised as being equitable for the study. In this regard, a coefficient of 0.70 or degree at a higher rating was viewed as reliable for the study (Bryman & Bell, 2012). A reliable factor analysis was executed based on the sample size that was sufficiently huge enough at 310 (Costello & Osborne, 2011).

3.13.2 Validity of the Study

Validity is regarded as a monitoring tool that observes whether the research outputs being archived meet all of the desired results for the scientific research method for the entire experimental concept (Csikszentmihalyi & Larson, 2014; and Dudovskiy, 2016). In this study, validity relates to the relationship between the description and justification

of other sources regarded as a phenomenon that account for whether that phenomenon is constructed as objective reality, participants or a diversity of other possible interpretations (Shuttleworth, 2015; and Dudovskiy, 2016).

The research validity was ensured by adhering to the following steps:

- The questionnaire was based on assumptions from accepted theories as set out in the literature review;
- The questionnaire was focused on the conceptual framework that was in itself based on academically accepted theory and models;
- A pilot survey was conducted to pre-test the questionnaire to get rid of mistakes and weaknesses;
- The sample size of 310 lead to increased precision in estimates of various characteristics of the population that was calculated with a margin of error of not more than 5% and a confidence level of 95% was used;
- Research validity was divided into two groups; internal validity that referred to how the research findings matched reality and external validity that referred to the extent to which the research findings was replicated from other environments (Dudovskiy, 2016);
- In addition, content validity , construct validity and face validity was ensured;
- Content validity was ensured as all dimensions of the research study was obtained from the literature review (Lobiondo-Wood & Haber, 2013). Construct validity was ensured by selecting and testing the relationship between the measurement items and the constructs used (Bagozzi & Yi, 2012). Face validity was ensured by the inclusion of variables as discussed by the scientific community (Bryman, Hirschsohn, Du Toit & Wagner, 2014; and Shuttleworth, 2015); and
- Internal validity was considered for its accurate procedures and experiment ability to draw correct assumptions or inferences about the results (Sarniak, 2015).

3.13.3 Objectivity

The objective of this study was to determine the factors impacting the Actual Adoption of EAA for SCM in SMEs. The concepts and terms was used to give a clear meaning

for analysing and describing the research. The researcher did not participate in the completion of the questionnaires and use the results from the analysis. All findings are based on the results of the analysis and conclusions drawn were based on the findings. Care was taken to make sure that the findings are reliably and fairly represent the results. The interpretations and conclusions were drawn logically from the research findings in chapter four.

3.14 Ethical Considerations

Ethical considerations in this research study were considered as critical norms or standards for conduct that distinguished and determined the difference between acceptable and unacceptable behaviours, as they helped the researcher to prevent fabrication or falsifying of data by promoting the quest of information and certainty (Lewis *et al.,* 2012; and Centre for Innovation in Research and Teaching, 2018). Ethical practices were followed and as such incorrect, deceptive or undocumented statements were avoided. The accuracy of data for analysis was not exaggerated.

The research findings and analysis are presented with trustworthiness, accurately and questionnaires are securely kept for future reference as evidence; and full justification is specified in case the ethical principles were not encountered (Fouka & Mantzorou, 2019). The researcher documented all data sources in the form of citations and references. Ethical clearance was obtained from Turfloop Research Ethics Committee (TREC) at the University of Limpopo before the start of data collection.

Informed consent provided participants with the following assurances (Coville, 2011; Kowalczyk, 2019; and Fouka & Mantzorou, 2019):

- Their participation is voluntary;
- They are not feeling pressured to participate;
- They can withdraw from the survey at any time;
- Their personal-contact details were not needed;
- Their confidentiality and privacy will be maintained;
- They have the rights to refuse to partake in the survey; and
- The survey offers guarantee on anonymity and confidentiality for their participation.

The actual benefit is that the researcher is prepared to write journal articles from the research findings in line with the research objectives, and most enterprises benefited by making informed decisions whether or not adopt EAA in SCM. The researcher will publish five journal articles from the study and they will be accessed from the website of the university. There is risk in putting the lives of the respondents in danger, hence the research does not use any body-related samples. Furthermore, both sensitive, confidential and personal questions were not asked in order to maintain dignity and privacy for all respondents.

3.15 Conclusion

A critical assessment and examination on the existing theory allowed the author to structure and formulate the research methodology to accomplishing the objectives for the research. The researcher applied a quantitative research using a descriptive survey design. Stratified Random Sampling was used with Random Sampling in the stratified groupings to ensure that the entire population was represented in the sample for generalisability of the results. A questionnaires with f Likert scale measures were distributed and collected for data analysis. The population sample was regarded as both SMEs owners and managers.

CHAPTER 4: DISCUSSION, PRESENTATION AND INTERPRETATION OF THE FINDINGS

4.1 Introduction

This chapter presents the results of the data analysis based on dual aspects. Firstly, the fitness of the data for analysis is discussed on reliability, validity and testing for normality and, secondly, the relationships among the variables to investigate the research hypotheses in the conceptual framework are discussed. The Kolmogorov-Smirnov diagnostic test for normality was used to determine if sample scores of the population follow the normal distribution. The Kolmogorov-Smirnov diagnostic test was used to determine the normality of data on both the skewedness and Kurtosis in distribution of data for variables. The Cronbach's Alpha test was used to measure reliability or internal consistency among the test items in the questionnaire.

Two tools were used to authenticate the results, such as, Pearson Correlation and Pearson Coefficient. The hypotheses testing were conducted through Analysis of Variance (ANOVA). The Linear Regression Model was used for modelling the relationship between dependent variable and independent variables based on one or more explanatory variables. This chapter is partitioned into two sections, namely, Section A for testing reliability and validity analysis on normality of data; and Section B for discussing the relationships among the variables in the conceptual framework, presenting and interpreting the findings.

4.2 Section A: Reliability and Validity Analysis and Testing for Normality

4.2.1 Research sample results

The research sample was taken from a population of 1900 and it included both SMEs owners and managers. Three hundred and ten (310) useable questionnaires were collected from a total sample of 480. A total of 105 questionnaires were not collected from the respondents due to their postponement and delays. Only 65 questionnaires were spoiled, thus leaving a valid return of 310 questionnaires. All tests provided results that allowed hypotheses testing and regression analysis. The Kolmogorov-Smirnov Test was used for assessing normality based on its ability for testing large samples ranging from 300. On the other hand, the Shapiro-Wilk Test is also an appropriate measure in this research study as it is for small sample sizes from < 50 to 2000. For this reason, only Kolmogorov-Smirnov Test was used as the statistical test for assessing normality.

4.2.2 Data Reliability

The conceptual framework is shown in Figure 4.1 and it is simplified to indicate the variables that are used in the data analysis.

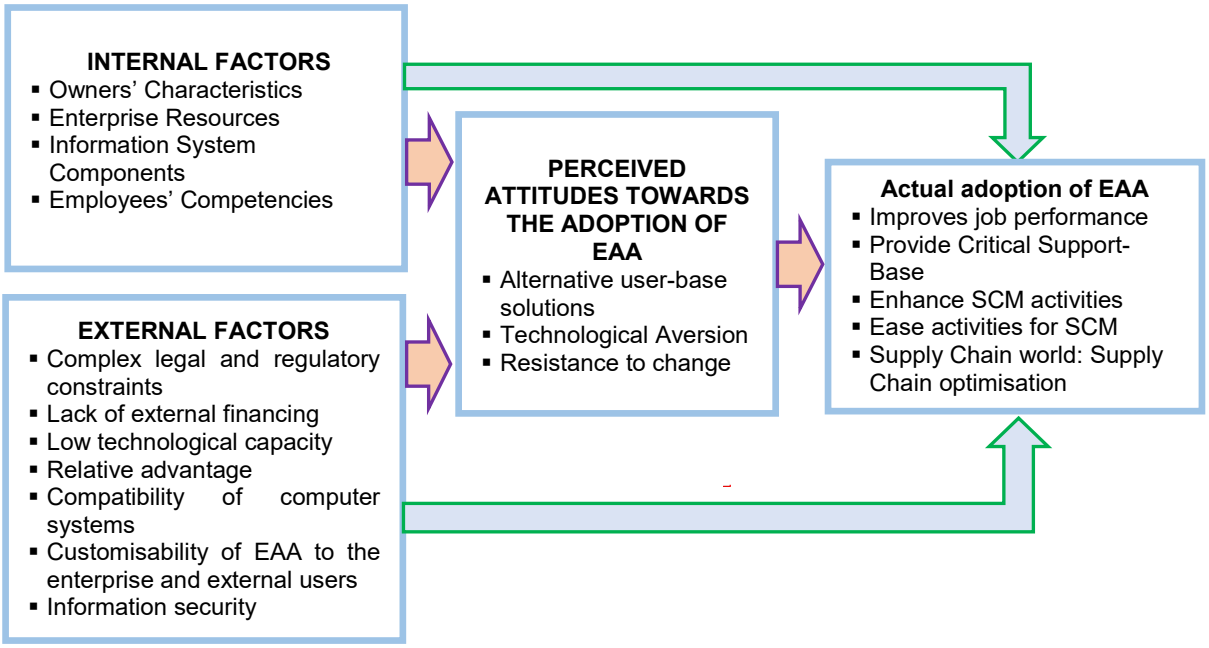


Figure 4.1: The Conceptual Research Model
Source: Author Conceptualisation

Data reliability is confirmed by using Cronbach's Alpha in determining the internal consistency for the questionnaire items that provided the assurance of the accuracy.

The internal factors are each separately measured and tested for internal consistency among the variables. The model is designed to show the Actual Adoption of EAA for SCM in SMEs.

The Cronbach's Alpha for the constructs are shown in Table 4.1. The survey used a multiple Likert-type scales and reliability of the research hypotheses was also tested (Koushik, 2013).

Table 4.1: Cronbach's Alpha per Construct

ITEM-TOTAL STATISTICS	
Variables	**Cronbach's Alpha**
Owners' Characteristics	0,880
Enterprise Resources	0,874
Information System Components	0,876
Employees' Competencies	0,878
External factors	0,882
Perceived Attitudes towards the Adoption of EAA	0,893
Actual Adoption of EAA	0,880

Source: Author Conceptualisation

All constructs have scores higher than 0.80, which is above the cut-off point of 0.70. From these findings, it can be concluded that the questionnaires to measure the constructs are reliable in determining internal factors, external factors and Perceived Attitudes towards the Adoption of EAA affecting the Actual Adoption of EAA for SCM in SMEs.

4.2.3 Validity

The research validity was concerned with the relationships between external basis and its occurrence if that occurrence is interpreted as objective reality, construction of actors or a variety of other possible interpretations that are based on goodness-of-fit was based on variety of other possible interpretations.

4.3 Testing the Suitability of the Sampled Data for Inferential Analyses

4.3.1 Introduction

The tests that were carried out included tests for Kurtosis, skewedness and the Kolmogorov-Smirnoff test for normality of the data. Two distributions methods could be used to define the nature of the distribution. Firstly, normal distribution is indicated by asymmetrical distribution where the values of variables occur at regular

occurrences with the mean, median and mode tending to be the same and produce a bell curve; the shape is like a bell and there is no skewness. Secondly, it could be regarded as an asymmetrical distribution where there is irregular frequencies as the mean, median and mode occur at different points from all variables, with skewness either to the left or right side. The standard normal distribution has a Kurtosis of zero and a positive Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "flat" distribution.

The Kurtosis figure should be near zero (0). The skewedness for a normal distribution is 0, and any symmetric data should have a skewedness near zero. Negative values for the skewedness indicate data that are skewed left and positive values for the skewedness indicate data that are skewed right. In the Kolmogorov test, the test statistic p is calculated as a percentage that states how much the sample data deviate from a normal distribution. If $p < 0.05$, it can be accepted that the data does not come from a normal distribution. These tests are now applied to the distributions of the sampled data.

4.3.2 Descriptive Statistics on Internal Factors for SCM in SMEs

4.3.2.1 Descriptive Statistics on Normality Test for Owners' Characteristics

Owners' Characteristics are the entrepreneurial drive of the owner and are distinctive traits acquired at birth or learned through educational system, which includes, passion driven for enterprise success; creative thinking mind-set and in risk taking; discipline for action orientation; innovation abilities for hard-working; vision oriented; and owner's resilience (Kuhn, Galloway & Collins-Williams, 2016; and Duermyer, 2017).

Table 4.2 on page 106 demonstrates the results for Owners' Characteristics for the Actual Adoption of EAA for SCM in SMEs. The sample (n) is 310, with a range value (r) of 16.00 with the minimum (min) and maximum (max) at 14.00 and 30.00, respectively. The standard deviation (σ) is 3.263 as projected in Figure 4.2. Table 4.2 indicates skewedness at -0.196 and Kurtosis at -0.141.

Table 4.2: Descriptive Statistics on Normality Test for Owners' Characteristics

Descriptive Statistics											
Owners' Characteristics	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	16.00	14.00	30.00	22.8065	.18534	3.26320	-.196	.138	-.141	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The evidence processed on the descriptive statistical technique for Owners' Characteristic is arranged to contribute towards further statistical examination on Linear Regression Model.

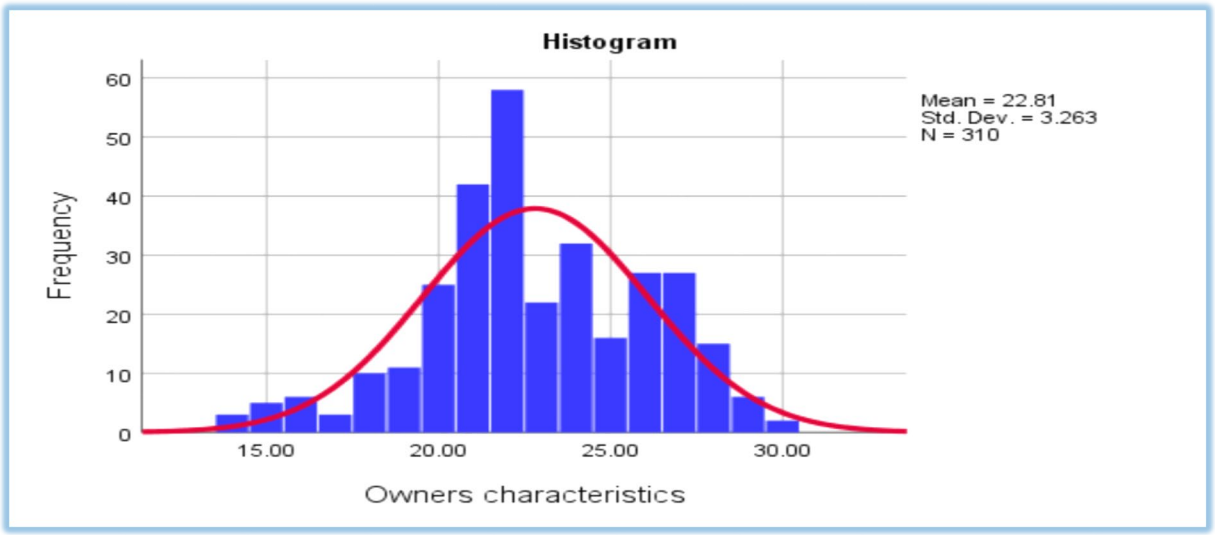


Figure 4.2: Normal Distribution on Owners' Characteristics
Source: Author Conceptualisation

As shown in Table 4.2 and Figure 4.2, the sample distribution for Owners' Characteristics produced a distribution curve with a mean (μ) of 22.81 and σ of 3.263. Owners' Characteristics produced a positive skewness at -.196 and Kurtosis at -.141. The standard normal distribution has a Kurtosis of zero and a negative Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "flat" distribution. The Kurtosis figure should be near 0, and the figure of -.141 indicates that it is a normal

distribution, which is slightly peaking is slightly skewed to the left. The distribution is symmetric as the μ is 0.228 and median is 0.220.

Table 4.3 presents the results for the Kolmogorov-Smirnov test for normality of Owners' Characteristic and the results indicate that Owners' Characteristics does follow a normal distribution, D (310) = 0.123 which is greater than p = 0.05.

Table 4.3: Kolmogorov-Sminorv and Shapiro-Wink Test on Owners' Characteristics

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	df	Sig.	Statistic	df	Sig.			
Owner's Characteristics	.123	310	.000	.974	310	.000	22.000	-.196	-.141
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The confirmation processed lead to the conclusion that the Owners' Characteristic can be used for statistical examination with a Linear Regression Model for analysing the relationship between Owners' Characteristic and the Actual Adoption of EAA in SMEs for SCM.

4.3.2.2 Descriptive Statistics on Normality Test for Enterprise Resources

The Enterprise Resources are factors of production, which includes human capital formation, capital, machinery, equipment and intellectual competencies that provide SMEs with the means to perform its SCM activities (Hersey & Blanchard, 2017).

The definition used in this analysis is the standard normal distribution has a Kurtosis of zero and a positive Kurtosis indicates a "peaked" distribution and positive Kurtosis indicates a "flat" distribution. Enterprise Resources produced a negative skewness at -.396 and Kurtosis at .116. The Kurtosis figure should be near 0, and the figure of 0.116 indicates that it is a normal distribution which is slightly peaking. The normal distribution is slightly skewed to the right.

Table 4.4 on page 108 demonstrates the results for Enterprise Resources for the Actual Adoption of EAA for SCM in SMEs. Where n = 310, r = 28.00, min = 8.00 and max = 36.00. The σ = 4.174, skewedness = -0.396 and Kurtosis is 0.116.

Table 4.4: Descriptive Statistics on Normality Test for Enterprise Resources

Descriptive Statistics											
Enterprise Resources	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	28.0	8.00	36.0	23.3871	.23707	4.17403	-.396	.138	.116	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The evidence produced on the descriptive statistical technique for Enterprise Resources is used to contribute for promote statistical analysis on Linear Regression Model for definitive results on the Actual Adoption of EAA for SCM in SMEs in SMEs.

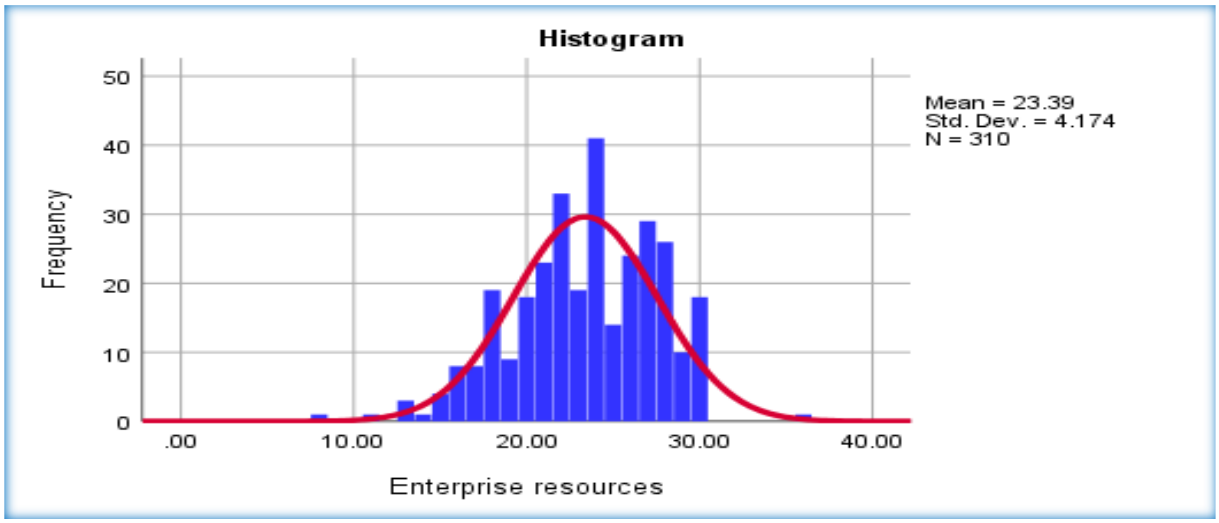


Figure 4.3: Normal Distribution on Enterprise Resources
Source: Author Conceptualisation

As presented in Table 4.4 and Figure 4.3, the sample distribution for enterprise Resources produced a distribution curve with a μ of 23.39 and σ of 4.174. Enterprise Resources produced a negative skewness at -.396 and Kurtosis at .116. The standard normal distribution has a Kurtosis of zero and a positive Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "flat" distribution. The Kurtosis figure should be near 0, and the figure of .116 indicates that it is a normal distribution which

is slightly peaking is slightly skewed to the left. The distribution is symmetric as the μ is 0.233 and median is 0.24.

Table 4.5 signifies the Kolmogorov-Smirnov test for normality of Enterprise Resources and the results indicate that the Enterprise Resources does follow a normal distribution, where; D (310) = 0.084, which is more than p = 0.05.

Table 4.5: Kolmogorov-Sminorv and Shapiro-Wink Test on Enterprise Resources

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	df	Sig.			
Enterprise Resources	.084	310	.000	.977	310	.000	24.000	-.396	.116
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The evidence processed lead to the interpretation that the Enterprise Resources can be used for statistical examination with a Linear Regression Model for analysing the relationship Enterprise Resources and the Actual Adoption of EAA for SCM in SMEs.

4.3.2.3 Descriptive Statistics on Normality Test for Information System Components

Information System Components are a combination of computer hardware and software, telecommunication, databases and data warehouses, which includes human resources, for conducting procedures that are combined together for processing data into digital information used in SCM activities (Zwass, 2017; and Gregersen, 2018).

The themes identified in the initial analysis of descriptive statistics in Table 4.6 exemplified in page 110 marked the provision on results for Information System Components towards the Actual Adoption of EAA for SCM in SMEs. The results for Information System Components for the Actual Adoption of EAA in SCM are as thus; n = 310, r = 18.00, min = 12.00 and max = 30.00, the σ = 3.761, skewedness = -0.595 and Kurtosis is -0.035.

Table 4.6: Descriptive Statistics on Normality Test for Information System Components

Descriptive Statistics											
Information System Components	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	18.00	12.00	30.00	24.0613	.21359	3.76057	-.595	.138	-.035	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The current statistical analysis on the Information System Components may contribute positive remarks for further statistical examination on Linear Regression Model for utmost results on the Actual Adoption of EAA for SCM in SMEs.

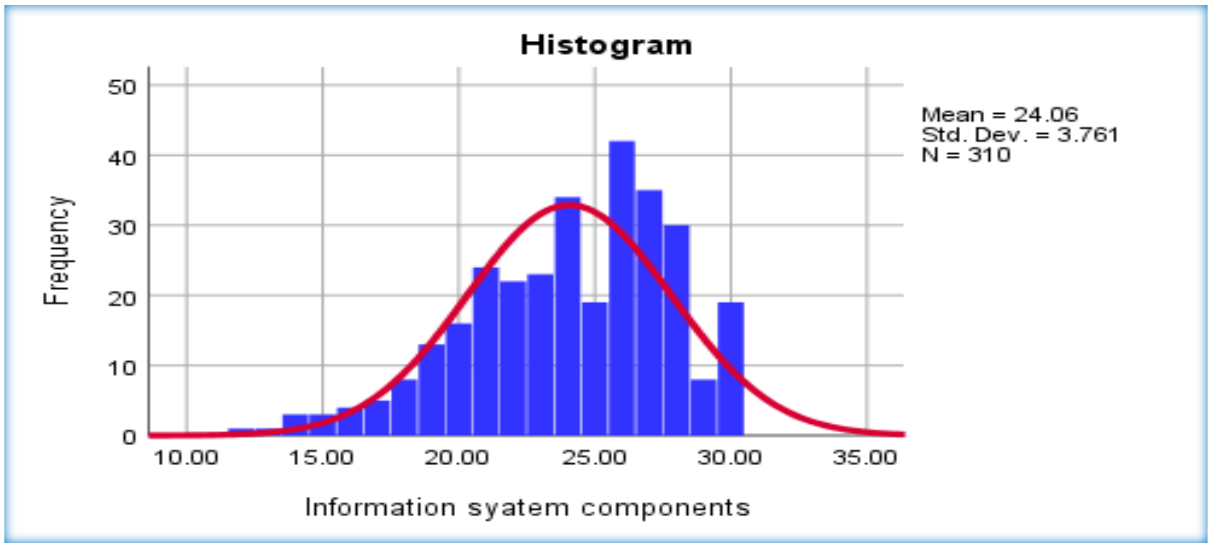


Figure 4.4: Normal Distribution on Information System Components
Source: Author Conceptualisation

As indicated in Table 4.6 and Figure 4.4, the sample distribution for Information System Components produced a distribution curve with a μ of 0.240 and σ of 3.761. Information System Components produced a negative skewness at -.595 and Kurtosis at -.035. The standard normal distribution has a Kurtosis of zero and a negative Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "flat" distribution. The Kurtosis figure should be near 0, and the figure of -.035 indicates that

it is a normal distribution which is slightly peaking is slightly skewed to the left. The distribution is asymmetric as the μ is 0.240 and median is 0.290.

Table 4.7 signifies the Kolmogorov-Smirnov test for normality of Information System Components and the results indicate that the Information System Components does follow a normal distribution, where; D (310) = 0.129 which is more than p = 0.05.

Table 4.7: Kolmogorov-Sminorv and Shapiro-Wink Test on Information System Components

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	Df	Sig.			
Information System Components Components	.129	310	.000	.961	310	.000	29.000	-.595	-.035
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The confirmation on evidence processed leads to the conclusion that the Information System Components can be used for statistical examination with a Linear Regression Model for analysing the relationship between Information System Components and the Actual Adoption of EAA for SCM in SMEs.

4.3.2.4 Descriptive Statistics on Normality Test for Employees' Competencies

Employees' Competencies are self-assessment on information systems based on elementary desktop computing skills, which are needed to use for computer efficiently for personal development, with the objective to encourage human capital formation to improve their skills and abilities (Viets, 2014; and Tolstoshev, 2017).

Post hoc analysis revealed that during the primary analysis on the descriptive statistics in Table 4.8 exemplified on page 112 provided substantial results for Employees' Competencies towards the Actual Adoption of EAA for SCM in SMEs. Where n = 310, r = 41.00, min = 18.00 and max = 59.00, the σ = 6.210, skewedness = -0.659 and Kurtosis is 0.178.

Table 4.8: Descriptive Statistics on Normality Test for Employees' Competencies

Descriptive Statistics											
Employees' Competencies	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	41.00	18.00	59.00	40.9452	.35276	6.21098	-.659	.138	.178	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The current statistical analysis on Employees' Competencies may contribute positive remarks for further statistical examination on Linear Regression Model for utmost results on the Actual Adoption of EAA for SCM in SMEs.

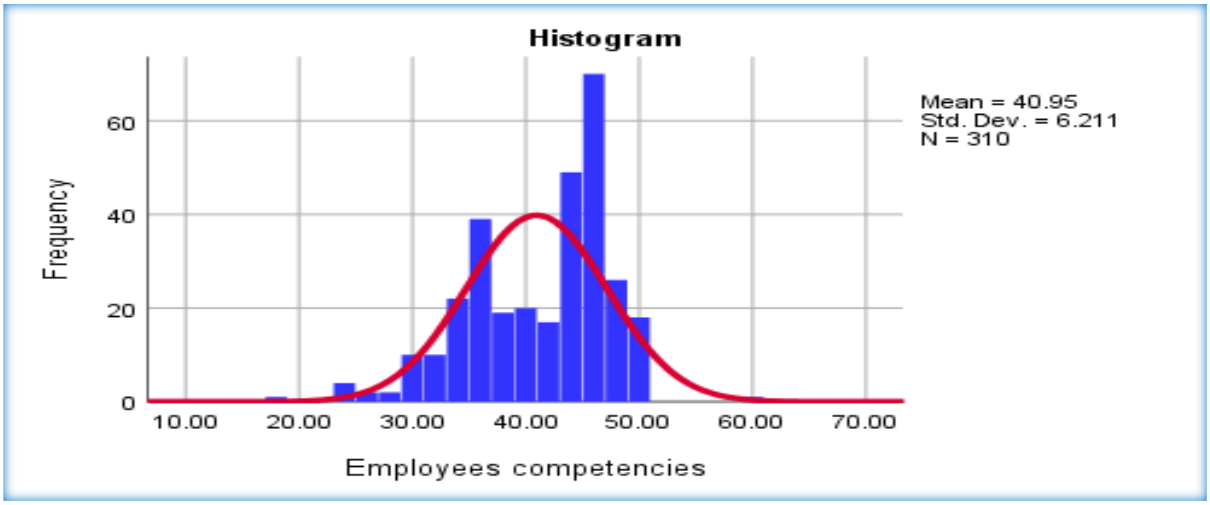


Figure 4.5: Normal Distribution on Employees' Competencies
Source: Author Conceptualisation

As illustrated in Table 4.8 and Figure 4.5, the sample distribution for Employees' Competencies produced a distribution curve with a μ of 40.95 and σ of 6.211. Employees' Competencies produced a positive skewness at -.695 and Kurtosis at .178. The standard normal distribution has a Kurtosis of zero and a positive Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "peak" distribution. The Kurtosis figure should be near 0, and the figure of .178 indicates that it is a normal distribution which is slightly peaking is slightly skewed to the left. The distribution is symmetric as the μ is 0.409 and median is 0.430.

Table 4.9 indicates the Kolmogorov-Smirnov test for normality of Employees' Competencies and the results indicate that the Employees' Competencies does follow a normal distribution, where D (310) = 0.17, which is more than pv = 0.05.

Table 4.9: Kolmogorov-Sminorv and Shapiro-Wink Test on Employees' Competencies

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	Df	Sig.			
Employee Competencies	.172	310	.000	.943	310	.000	43.000	-.695	.178
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The validation on evidence processed lead to the conclusion that the Employees' Competencies can be used for statistical examination with a Linear Regression Model for analysing the relationship between Employees' Competencies and the Actual Adoption of EAA for SCM in SMEs.

4.3.3 Descriptive Statistics on External Factors for SCM in SMEs

The external factors are elements that effect the business from outside world that included items such as; legal constraints; complex legal and regulatory constraints, lack of external financing, low technological capacity, relative advantage, compatibility to EAA, complexity of EAA, customisability and information security that hinder the use of new hardware and software in my business, lack of external financing impact the Actual Adoption of EAA (Ray, 2019; and Jessee, 2019).

Table 4.10 desplayed on page 114 is quite revealing in several ways. First, unlike the other tables that during the primary analysis on the descriptive statistics produced sufficient results for external factors towards the Actual Adoption of EAA for SCM, where n = 310, r = 28.00, min = 7.00 and max = 35.00, the σ = 5.571, skewedness = -1.165 and Kurtosis = 1.185.

Table 4.10: Descriptive Statistics on Normality Test for External Factors

Descriptive Statistics											
External Factors	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	28.00	7.00	35.00	27.8935	.31643	5.57139	-1.165	.138	1.185	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The current statistical analysis on the external factors may contribute positive remarks for further statistical examination on Linear Regression Model for utmost results on the Actual Adoption of EAA for SCM in SMEs.

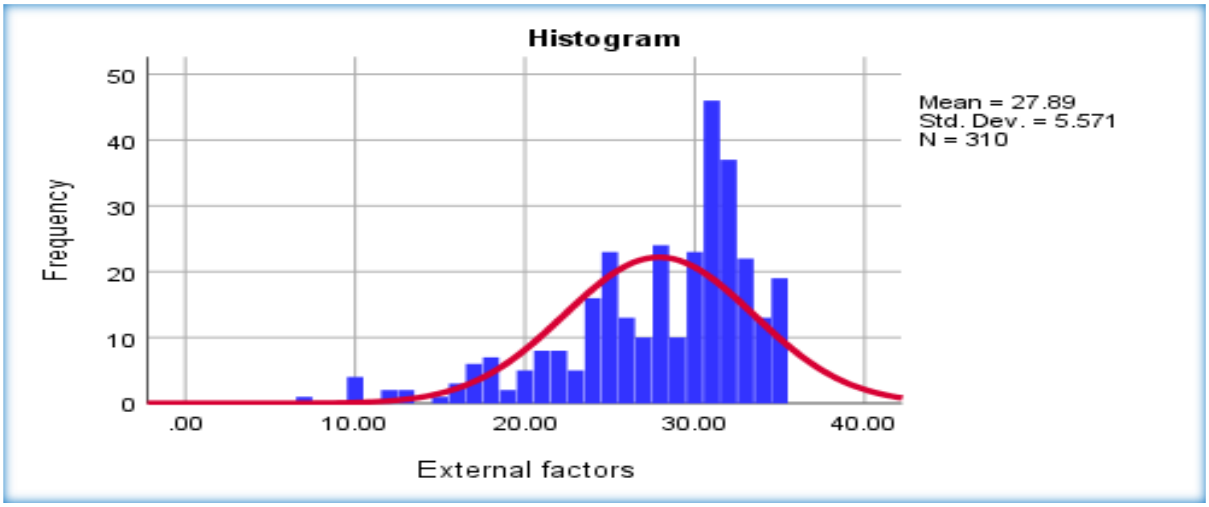


Figure 4.6: Normal Distribution on External Factors
Source: Author Conceptualisation

As presented in Table 4.10 and Figure 4.6 the sample distribution for external factors produced a distribution curve with a μ of 27.89 and σ of 5.571. External factors produced a negative skewness at -1.165 and Kurtosis at 1.185. The standard normal distribution has a Kurtosis of zero and a positive Kurtosis indicates a "peaked" distribution and positive Kurtosis indicates a "flat" distribution. The Kurtosis figure should be near 0, and the figure of -1.165 indicates that it is a normal distribution which is slightly peaking is slightly skewed to the left. The distribution is asymmetric as the μ is 27.89 and median is 0.30.

Table 4.11 shows the Kolmogorov-Smirnov test for normality of external factors and the results indicate that the external factors does follow a normal distribution, where D(310) = 0.163 which is more than p = 0.05.

Table 4.11: Kolmogorov-Sminorv and Shapiro-Wink Test on External Factors

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	Df	Sig.			
External Factors	.163	310	.000	.900	310	.000	30.000	-1.165	1.185
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The validation on confirmation processed leads to the conclusion that the external factors can be used for statistical examination with a Linear Regression Model for analysing the relationship between external factors and the Actual Adoption of EAA for SCM in SMEs.

4.3.4 Descriptive Statistics on Perceived Attitudes on the Actual Adoption of EAA for SCM in SMEs

Perceived Attitudes on the Actual Adoption of EAA remains poorly defined term as the degree of mental or neutral state of readiness, organised through experience, exercising a directive or dynamic influence on the individual's response to all objects and situations to which it is related, will enhance the job performance (Eckler & Bolls, 2011; and Fenech, 2018).

An analysis of the questions that measure the item and perceived attitudes towards actual adoption shows that the questions negatively-keyed items. On page 116, there is a table as an Extraction from ANNEXURE C**:** Questions on perceived attitude to adopt EAA for SCM. Therefore, any positive results on hypotheses testing should be considered as negative and vice versa or the sign should be reversed in the data set. The interpretation of a negative as positive was chosen, otherwise all the tests had to be redone where attitude to adopt was used as a variable.

Extraction from ANNEXURE C: Questions on perceived attitude to adopt EAA for SCM

Sigma Notations	Please tick an appropriate box (✓) from 7.1 to 7.4	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
7.1)	I sometime use old work procedures to process my daily activities.	(1)	(2)	(3)	(4)	(5)
7.2)	I dislike technological processes.	(1)	(2)	(3)	(4)	(5)
7.3)	My work is not secured when I use Information Technology.	(1)	(2)	(3)	(4)	(5)
7.4)	I only use technology under supervision.	(1)	(2)	(3)	(4)	(5)

Source: Author Conceptualisation

Table 4.12 below indicates the themes identified for the responses during the primary analysis on the descriptive statistics for Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs. The substantial results for Perceived Attitudes towards the Actual Adoption of EAA for SCM, where n = 310, r = 8.00, min = 12.00 and max = 20.00, the σ = 2.085, skewedness = -0.147 and Kurtosis = -0.455.

Table 4.12: Descriptive Statistics on Normality Test for Perceived Attitudes

Descriptive Statistics											
Perceived Attitudes towards the Adoption of EAA	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	8.00	12.00	20.00	16.7419	.11842	2.08505	-.147	.138	-.455	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The current statistical analysis on the Perceived Attitudes towards the Adoption of EAA may contribute positive remarks for further statistical examination on Linear Regression Model for utmost results on the Actual Adoption of EAA for SCM in SMEs.

Figure 4.7 indicated on page 117 presents a normal distribution on external factors with a symmetrical distribution, comprised of negative skewedness and positive Kurtosis shown as flat-shaped distribution as specified in Table 4.6. It then produced

a shape on the distribution for external factors is more skewed to the right-side with a long tail, relative to the left tail that resulted into a horizontal Kurtosis.

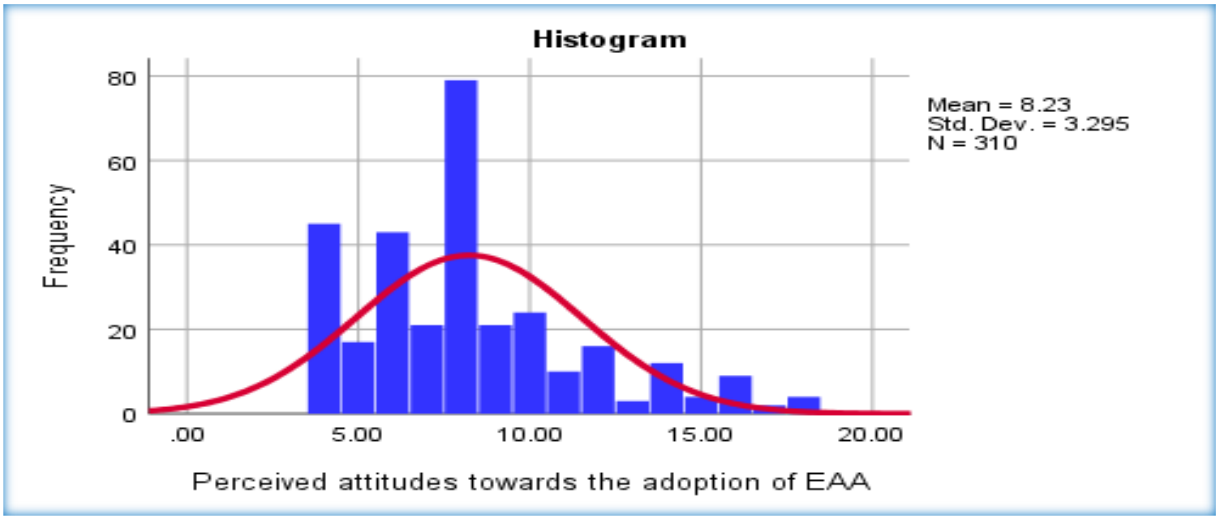


Figure 4.7: Normal Distribution on Perceived Attitudes towards the Adoption of EAA
Source: Author Conceptualisation

An implication of this is the possibility that a statistical inspection is decent when applied with the declaration that the outcomes can absolutely be used for hypotheses analysis.

As presented in Table 4.12 and Figure 4.7, the sample distribution for Perceived Attitudes on the Actual Adoption of EAA produced a distribution curve with a μ of 8.23 and σ of 3.295. Perceived Attitudes on the Actual Adoption of EAA produced a positive skewness at -.147 and Kurtosis at -.455. The standard normal distribution has a Kurtosis of zero and a negative Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "peak" distribution. The Kurtosis figure should be near 0, and the figure of -.455 indicates that it is a normal distribution which is slightly peaking is slightly skewed to the left. The distribution is asymmetric as the μ is 8.23 and median is 9.00.

Table 4.13 indicated on page 118, demonstrates the Kolmogorov-Smirnov test for normality on Perceived Attitudes towards the Actual Adoption of EAA and the results indicate that the Perceived Attitudes towards the Actual Adoption of EAA does follow a normal distribution, where D (310) = 0.189, which is more than p = 0.05.

Table 4.13: Kolmogorov-Sminorv and Shapiro-Wink Test on Perceived Attitudes towards the Adoption of EAA

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	df	Sig.			
Perceived Attitudes	.189	310	.000	.913	310	.000	9.000	.905	.497
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The validation on confirmation processed leads to the conclusion that the Perceived Attitudes towards the Adoption of EAA can be used for statistical examination with a Linear Regression Model for analysing the relationship between Perceived Attitudes towards the Adoption of EAA and the Actual Adoption of EAA for SCM in SMEs.

4.3.5 Descriptive Statistics on Actual Adoption of EAA for SCM in SMEs

Actual adoption entails the acceptable practise of EAA activities that include relative advantage, compatibility, complexity, trialability and observability for SCM in SMEs (Kousar, 2017; and Bozeman, 2018).

Table 4.14 presents the analysis of descriptive statistics according to level of respondents during the main analysis for Actual Adoption of EAA for SCM, where n = 310, r = 16.00, min = 14.00 and max = 30.00, the σ = 3.405, skewedness = -0.289 and Kurtosis = -0.344.

Table 4.14: Descriptive Statistics on Normality Test for Actual Adoption of EAA

Descriptive Statistics											
Actual Adoption of EAA	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewedness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
	310	16.00	14.00	30.00	23.8903	.19338	3.40487	-.289	.138	-.344	.276
Valid N (Listwise)	310										

Source: Author Conceptualisation

The current statistical analysis on Actual Adoption of EAA may contribute positive remarks for further statistical examination on Linear Regression Model for utmost results with numerous variables, such as, internal factors, external factors and Perceived Attitudes towards the Adoption of EAA.

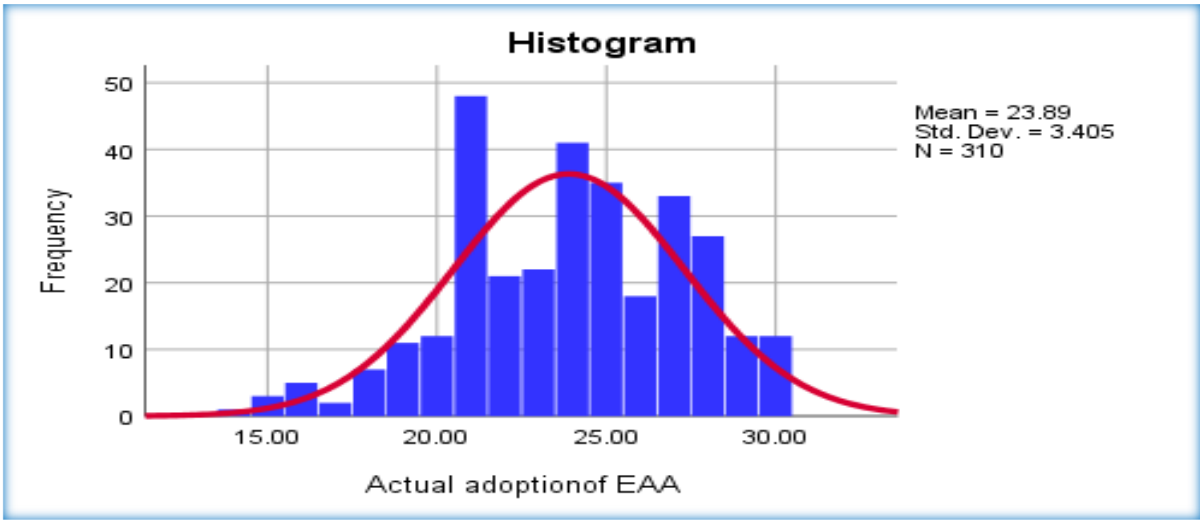


Figure 4.8: Normal Distribution on Actual Adoption of EAA
Source: Author Conceptualisation

As presented in Table 4.14 and Figure 4.8, the sample distribution for Actual Adoption of EAA for SCM produced a distribution curve with a μ of 23.89 and σ of 3.405. Actual Adoption of EAA for SCM produced a negative skewness at -.289 and Kurtosis at -.344. The standard normal distribution has a Kurtosis of zero and a negative Kurtosis indicates a "peaked" distribution and negative Kurtosis indicates a "flat" distribution. The Kurtosis figure should be near 0, and the figure of -.349 indicates that it is a normal distribution which is slightly peaking and it is slightly skewed to the left. The distribution is symmetric as the μ is 23.89 and median is 0.24.

Table 4.15 indicated on page 120 validates the Kolmogorov-Smirnov test for normality on Actual Adoption of EAA and the results indicate that the Actual Adoption of EAA does follow a normal distribution, where D (310) = 0.090, which is more than p = 0.05.

Table 4.15: Kolmogorov-Sminorv and Shapiro-Wink Test on Actual Adoption of EAA

Tests of Normality									
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Median	Skewedness	Kurtosis
	Statistic	Df	Sig.	Statistic	df	Sig.			
Actual Adoption of EAA	.090	310	.000	.973	310	.000	24.000	-.289	-.349
a. Lilliefors Significance Correction									

Source: Author Conceptualisation

The validation on evidence processed leads to the conclusion that the Actual Adoption of EAA can be used for statistical examination with a Linear Regression Model for analysing the relationship between all variables and the adoption of EAA for SCM in SMEs.

SECTION B: RESULTS OF HYPOTHESES TESTING

4.4. Introduction

This chapter presents the results of data analysis. This chapter is partitioned into two sections: (a) Section A for reliability and validity analysis and testing for normality; and (b) Section B for discussing the relationships among the variables in the conceptual framework. In order to test the hypotheses, certain tests were done and the results were presented in Section A. In this section, data analysis is presented. Firstly, reliability of data was tested through the use of Cronbach's Alpha. Secondly, the Kolmogorov test were used to test if the distributions of the variables' data represents normal distributions were done. Thirdly, the mean, mode, median, the standard deviation (σ) the minimum, maximum were calculated for each variable. None of the items had to be removed for all Cronbach's Alphas were in the acceptable range, that is, above 0.80. The Kolmogorov-Smirnov diagnostic test for normality was used to determine if the sample scores of the population follow the normal distribution**.**

Overall, the sampled data were found to be suitable for further analysis to test the hypotheses. Inferential statistics was used to analyse data if the relationships among variables exist. The constructs were, namely, internal factors, external factors, perceived attitude towards the adoption of EAA and Actual Adoption of EAA. The internal Factors construct had four sub-variables Owners' Characteristics, Enterprise Resources, Information System Components and Employees' Competencies.

The following tests were done:

- The Pearson Correlation Coefficient was used to determine the strength of the linear association between the constructs;
- Analysis of Variance (ANOVA) is used for two reasons: (a) to determine whether any differences at all axis, and (b) to ascertain the nature of the difference;
- The difference refers to the null hypotheses as the null hypotheses specifies that there is no difference;
- The Anova test is, therefore, used to either accept or not accept the null hypotheses; and
- A Linear Regression Model was then used to illustrate the relationship.

Last but not least, data were distributed thus: (a) symmetrical distribution occurs when the values of variables occur at regular occurrences of which the mean, median and mode take place on the same spot and produce a bell curve; and (b) asymmetric distribution occurs when the values of variables take place at an irregular frequencies where the mean, median and mode occur at different locations and the shape is like a bell curve where both sides of the graph are symmetrical. At a later stage, the Multinomial Logistic Regression is used between the dependent variables that are equivalently categorical, of which five categories were used to ascertain the results for all constructs on Pearson Correlation Coefficients, Analysis of Variance, Coefficients and Linear Regressions.

4.5 Descriptive Statistics on Variables

The alternative hypotheses stated that there is a positive relationship between internal factors and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs. This was ascertained by testing four sub-hypotheses on Owners' Characteristics, Enterprise Resources, Information System Components and Employees' Competencies.

4.5.1 Owners' Characteristics and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

4.5.1.1 Pearson Correlations on Owners' Characteristics and Perceived Attitudes towards Adoption of EAA for SCM

Table 4.16 illustrated on page 123, specifies the results on correlations between Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. In this regard, the statistical method "ANOVA" is applied to test the hypotheses between the dependent variable, namely, Perceived Attitudes towards the Actual Adoption of EAA and independent variable, namely, Owners' Characteristics discussed in Table 4.17.

Pearson Correlation Coefficient is .215, thus indicating that there is a positive relationship between Owners' Characteristics and Perceived Attitudes to the Actual Adoption of EAA.

Table 4.16: Pearson Correlations on Owners' Characteristics and Perceived Attitudes

Pearson Correlations			
		Perceived Attitudes towards the Adoption of EAA	Owners' Characteristics
Perceived Attitudes towards the Adoption of EAA	Pearson Correlation	1	.215**
	Sig. (2-tailed)		.000
	N	310	310
Owners' Characteristics	Pearson Correlation	.215**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

The findings on association suggest that, in general, there is a positive relationship between Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA bearing the change of the sign in mind.

4.5.1.2 ANOVA on Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs

Table 4.17 below presents the ANOVA results obtained for scores on owners' characteristic and Perceived Attitudes towards the Actual Adoption of EAA.

Table 4.17: ANOVA on Owners' Characteristics and Perceived Attitudes towards the Adoption of EAA for SCM

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	62.233	1	62.233	14.962	.000[b]
	Residual	1281.122	308	4.159		
	Total	1343.355	309			
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA						
b. Predictors: (Constant), Owners' Characteristics						

Source: Author Conceptualisation

The overall F-statistic is significant (F = 14.962, p < .000), thus indicating that, in general, the model accounts for a significant percentage of the variation in the Actual Adoption of EAA for SCM in SMEs. Since the exact significance level is .001<alpha (α) at .05 the results are statistically significant. The alternative sub-hypotheses (sub-H_{a1}) that "Owners' Characteristics affect the Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs" is accepted, whilst the sub-hypotheses (sub-H_{01}) that "Owners' Characteristics do not affect Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs" is rejected.

4.5.1.3 Pearson's Coefficients on Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs

Table 4.18below presents the coefficients results for Perceived Attitudes towards the Adoption of EAA ($\bar{y}$) and Owners' Characteristics (x). The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.2 and Figure 4.2).

Table 4.18: Pearson Coefficients on Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13.605	.819		16.61	.0		
	Owners' Characteristics	.138	.036	.215	3.833	.0	1.000	1.000
a. Dependent Variable: Perceived Attitudes towards the Actual Adoption of EAA								

Source: Author Conceptualisation

The t-test is at 16.610, where; the Ý constant intercept a =.138 and the Ý constant intercept b = 13.605. In this circumstances, the estimated Ý is comprised of the score = 13.605 + .138, thus signifying that a unit increase in x causes a 13% increase in Ý. Therefore, t > significant point; where [16.610, 3.833].

4.5.1.4 Linear Regression on Owner' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs

Figure 4.9 below identifies Owners' Characteristics and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs. The R^2 value is 0.046 of the variance is being accounted for this scatter plot from the independent variable, namely, Owners' Characteristics.

The linear regression where $\bar{y}$= 13.61 + 0.14*x. The slope of 0.14 will bring same increase in $\bar{y}$. The R^2 = 0.046 indicates that, the level of variation in the Perceived Attitudes towards the Actual Adoption of EAA could be described by variation in the Owners' Characteristics. Moreover, the coefficient of determination (R^2) is converted to r as thus; $\sqrt{0.046}$ = 0.214 which is ≈ 0.215 which is confirmed in Table 4.16 from Pearson Correlation Coefficients.

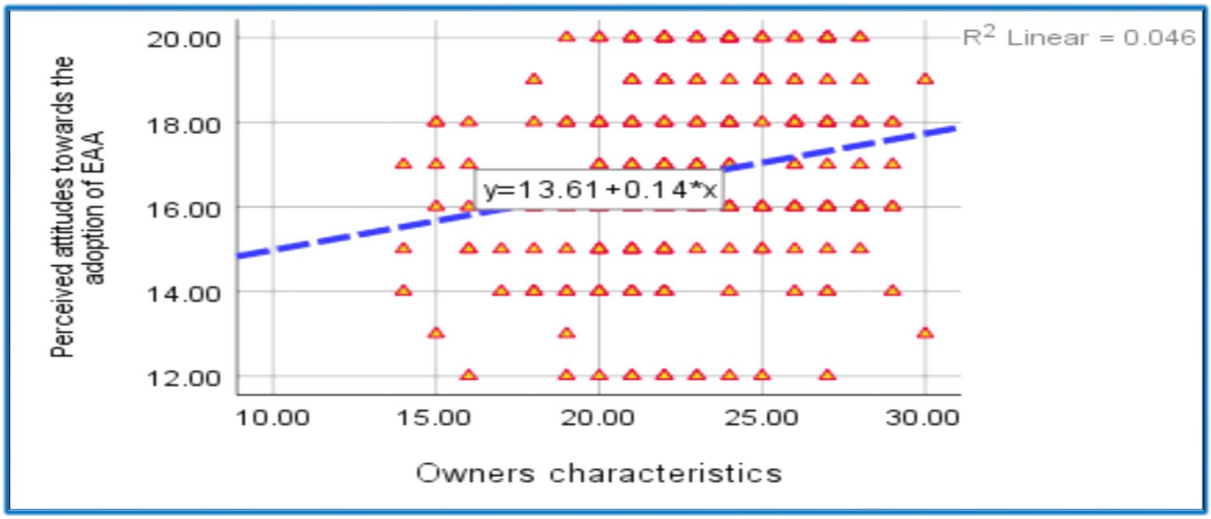


Figure 4.9: Linear Regression on Owners' Characteristics and Attitudes towards the Actual Adoption of EAA

Source: Author Conceptualisation

This confirms that the model is of the best fit for homoscedasticity with three assumptions, namely, that: the relationships between variables should be linear; the value of response variable (y) and explanatory (x) should have a normal distribution; and the standard deviations for both y and x should have the same figure.

4.5.2 Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs

4.5.2.1 Pearson Correlation on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs

The analysis for an association between Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs is indicated in Table 4.20. The p-value is .187 with the requisite value set at 0.05.

Table 4.19 indicated on page 126 demonstrates the results on correlations between Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA. The p-value is near zero at "<.001", with the required value set at 0.05. The statistical technique "ANOVA" was used to test the hypotheses between the dependent variable, namely, Perceived Attitudes towards the Actual Adoption of EAA and Enterprise Resources discussed in Table 4.20.

Table 4.19: Pearson Correlations on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA

Pearson Correlations			
		Perceived Attitudes towards the Adoption of EAA	Enterprise Resources
Perceived Attitudes towards the Adoption of EAA	Pearson Correlation	1	.187**
	Sig. (2-tailed)		.001
	N	310	310
Enterprise Resources	Pearson Correlation	.187**	1
	Sig. (2-tailed)	.001	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .187, thus indicating that there is a positive relationship between Enterprise Resources and Perceived Attitudes to the Actual Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA bearing the change of the sign in mind.

4.5.2.2 ANOVA on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA for SCM

Table 4.20 presents the ANOVA results obtained for scores on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA. The prognostic variable is regarded as Perceived Attitudes towards the Actual Adoption of EAA and the independent variable is regarded as Enterprise Resources.

Table 4.20: ANOVA on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA for SCM

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	46.991	1	46.991	11.164	.001[b]
	Residual	1296.364	308	4.209		
	Total	1343.355	309			
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA						
b. Predictors: (Constant), Enterprise Resources						

Source: Author Conceptualisation

The general F-statistic is significant (F=11.164, $p < .001$), thus signifying that, overall, the model accounts for a significant proportion of the variation in the Actual Adoption of EAA for SCM in SMEs. Since the exact significance level is $.001 < \alpha$ at .05 the results are statistically significant. The alternative sub-H_{a2} that; "Enterprise Resources

affect Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{02}that; "Enterprise Resources do not affect Perceived Attitudes towards the Actual Adoption of EAA for SCM in SMEs" is rejected.

4.5.2.3 Pearson Coefficients on Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA

Table 4.21 presents the coefficients results for Enterprise Resources and Perceived Attitudes towards the Actual Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.3 and Figure 4.3).

Table 4.21: Pearson Coefficients on Enterprise Resources and Perceived Attitudes towards the Adoption of EAA for SCM

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	17.838	1.047		17.035	.00		
	Information System Components	.259	.044	.317	5.871	.00	1.000	1.00
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA								

Source: Author Conceptualisation

In instances where the estimated Ý is comprised of Perceived Attitudes towards the Actual Adoption of EAA and Owners' Characteristics with the score = 17.838 + .259, then the t-test shows that the Ý constant a=17.838 and the Ý constant b=.259 are significantly different from zero. The independent t-test is used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is where the t-test [17.035, 5.871].

4.5.2.4 Linear Regression on Enterprise Resources and Perceived Attitudes towards the Adoption of EAA

Figure 4.10 indicated on page 128 provides the summary statistics for linear regression that provides an overview for the results signifying a positive b. The y-axis is regarded as Perceived Attitudes towards the Actual Adoption of EAA, a=y-axis intercept, positive b and x-axis = Enterprise Resources. The R^2 value is 0.035 of the variance is being accounted for this scatter plot from the independent variable as

Enterprise Resources. The linear regression satisfy three assumptions on a model for best fit as discussed in Figure 4.9.

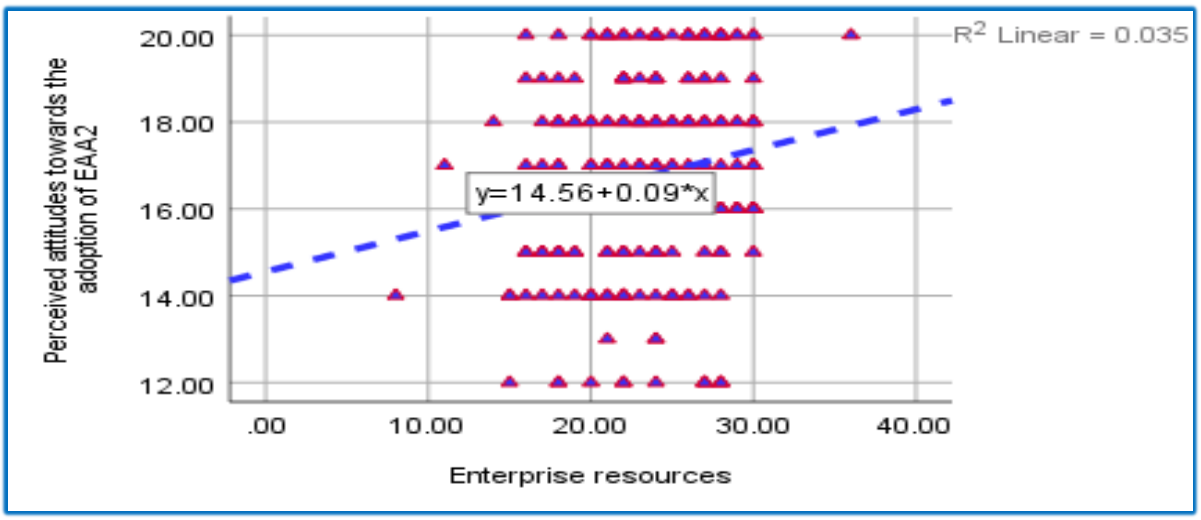


Figure 4.10: Linear Regression on Enterprise Resources and Perceived Attitudes towards the Adoption of EAA for SCM

Source: Author Conceptualisation

The linear regression where; $\bar{y}$ = 14.56 + 0.09*x. This shows that the slope of +0.09 will bring same increase in $\bar{y}$. The R^2=0.035 indicates that, the level of variation in the Perceived Attitudes towards the Actual Adoption of EAA could be described by variation in the Enterprise Resources. Moreover, the R^2 is converted to *r* as thus; √0.035 = 0.187and confirmed in Table 4.19 for Pearson Correlation. This endorses that the model is satisfactory with a positive slope.

4.5.3 Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

4.5.3.1 Pearson Correlation on Information System Components and Perceived Attitudes towards the Adoption of EAA

Table 4.22 indicated on page 129 demonstrates the results on Pearson Correlations between Information System Components and Perceived Attitudes towards the Actual Adoption of EAA. The p-value is near zero at “<.001” with the required value set at 0.05. The statistical technique “ANOVA” is used to test the hypotheses between the dependent variable, namely, Perceived Attitudes towards the Actual Adoption of EAA and independent variable, namely, Information System Components discussed in Table 4.23.

Table 4.22: Pearson Correlations on Information System Components and Perceived Attitudes towards the Adoption of EAA

Pearson Correlations			
		Perceived Attitudes towards the Adoption of EAA	Information System Components
Perceived Attitudes towards the Adoption of EAA	Pearson Correlation	1	-.074
	Sig. (2-tailed)		.176
	N	340	340
Information System Components	Pearson Correlation	-.074	1
	Sig. (2-tailed)	.176	
	N	340	340
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is -.074 indicating that there is a positive relationship between Information System Components and Perceived Attitudes to the Actual Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between Information System Components and Perceived Attitudes towards the Actual Adoption of EAA bearing the change of the sign in mind.

4.5.3.2 ANOVA on Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM

Table 4.23 displays the ANOVA results obtained for scores on Information System Components and Perceived Attitudes towards the Actual Adoption of EAA. The regress and variable is regarded as Perceived Attitudes towards the Actual Adoption of EAA and the independent variable is regarded as Information System Components.

Table 4.23: ANOVA on Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.37	1	23.370	1.837	.176[b]
	Residual	4301.156	338	12.725		
	Total	4324.526	339			
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA						
b. Predictors: (Constant), Information System Components						

Source: Author Conceptualisation

The overall F-statistic is significant ($F = 1.837$, $p < .176$), thus implying that, in general, the model is liable for a significant proportion of the variation in the Actual Adoption of EAA for SCM in SMEs. Since the exact significance level is $.176 < \alpha$ at .05, the results

are statistically significant. The alternative sub-H_{a3} that “Information System Components affect Perceived Attitudes on the Actual Adoption of EAA for SCM in SMEs” is accepted, whilst the sub-H_{03} that “Information System Components do not affect Perceived Attitudes on the Adoption of EAA for SCM in SMEs” is rejected.

4.5.3.3 Pearson Coefficients on Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM

Table 4.24 presents the coefficients results for Information System Components and Perceived Attitudes towards the Actual Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.4 and Figure 4.4).

Table 4.24: Pearson Coefficients on Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9.565	1.254		7.625	.000		
	Information System Components	-.060	.044	-.074	-1.35	.176	1.000	1.000
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA								

Source: Author Conceptualisation

In this regard, the estimated Ý is comprised of Perceived Attitudes towards the Actual Adoption of EAA and Information System Components with the score = 9.565- .06, then Information System Components t-test shows that the Ý constant a=-.060 and the Ý constant b=9.565 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the coefficient on t-test is [7.625, -1.355].

4.5.3.4 Linear Regression on Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM

The results obtained from the initial analysis of $\bar{y}$ in Figure 4.11 indicated on page 131 show endogenous variables outcomes for the following; the y-axis is regarded as Perceived Attitudes towards the Actual Adoption of EAA, a = y-axis intercept, positive b and x-axis = Information System Components. The linear regression satisfy three

assumptions on a model for best fit as discussed in Figure 4.9. The linear regression where $\bar{y}$= 9.56 - 0.06*x.

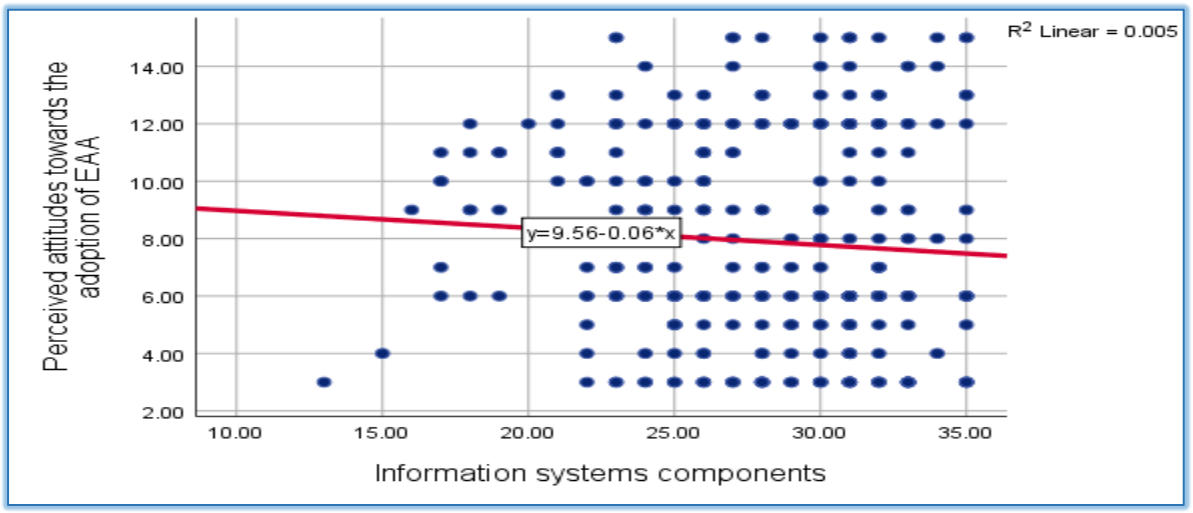


Figure 4.11: Linear Regression Model on Information System Components
Source: Author Conceptualisation

This shows that the slope of -0.006 will bring same decrease in $\bar{y}$. The R22=0.005 designates that, the level of variation in the Perceived Attitudes towards the Actual Adoption of EAA could be described by variation in the Information System Components. Likewise, the R2 is converted to r as thus $\sqrt{0.005} = 0.071 \approx 0.074$, and confirmed in Table 4.22 for Pearson Correlation Coefficients. This recommends that the model is acceptable with a negative slope.

4.5.4 Employees' Competencies Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

4.5.4.1 Pearson Correlations on Employees' Competencies and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

Table 4.25 indicated on page 132 exhibits the results on correlations between Employees' Competencies and Perceived Attitudes towards the Actual Adoption of EAA. The p-value is near zero at "<.001", with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Perceived Attitudes towards the Actual Adoption of EAA and independent variable, namely, Enterprise Resources discussed in Table 4.26.

Table 4.25: Pearson Correlations on Employees' Competencies and Perceived Attitude towards the Adoption of EAA

Pearson Correlations			
		Perceived Attitudes towards the adoption of EAA	Employees' Competencies
Perceived Attitudes towards the adoption of EAA	Pearson Correlation	1	.201**
	Sig. (2-tailed)		.000
	N	310	310
Employees' Com-petencies	Pearson Correlation	.201**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .201, thus indicating that there is a positive relationship between Employees' Competencies and Perceived Attitudes to the Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between employees' characteristics and Perceived Attitudes towards the Adoption of EAA bearing the change of the sign in mind.

4.5.4.2 ANOVA on Employees' Competencies

Table 4.26 displays the ANOVA results obtained for scores on Employees' Competencies and Perceived Attitudes towards the Adoption of EAA. The regress and variable is regarded as Perceived Attitudes towards the Adoption of EAA and the independent variable is regarded as Employees' Competencies.

Table 4.26: ANOVA on Employees' Competencies

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	54.312	1	54.312	12.977	.000[b]
	Residual	1289.043	308	4.185		
	Total	1343.355	309			
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA						
b. Predictors: (Constant), Employees' Competencies						

Source: Author Conceptualisation

The general F-statistic is significant (F = 12.977, p < .001), thus indicating that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is .001 < alpha α at .05 the results are statistically significant. The alternative sub-H_{a4} that; "Employees' Competencies

affect Perceived Attitudes towards the Adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{04} that "Employees' Competencies does not affect Perceived Attitudes towards the Adoption of EAA for SCM in SMEs" is rejected.

4.5.4.3 Pearson Coefficients on Employees' Competencies and Perceived Attitudes towards the Adoption of EAA for SCM

Table 4.27 presents the coefficients results for Employees' Competencies and Perceived Attitudes towards the Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.5 and Figure 4.5).

Table4.27: Pearson Coefficients on Employees' Competencies and Perceived Attitudes towards the Adoption of EAA

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13.9	.776		18.0	.00		
	Employees' Competencies	.068	.019	.201	3.57	.00	1.000	1.000
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA								

Source: Author Conceptualisation

In situations where the estimated Ý is comprised of Perceived Attitudes towards the Adoption of EAA and Employees' Competencies with the score = 13.978 + 0.068, then the t-test shows that the Ý constant a = 13.978 and the Ý constant b=.068 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [18.012, .201].

4.5.4.4 Linear Regression Model on Employees' Competencies and Perceived Attitudes towards the Adoption of EAA for SCM

From the data in Figure 4.12 on page 134 indicates that; $\bar{y}$ account for y-axis as Perceived Attitudes towards the Adoption of EAA, b = 0.07 and x = x-intercept as Employees' Competencies. The R^2 value is 0.040 of the variance is being accounted for this scatter plot from the independent variable, namely, Employees' Competencies.

The linear regression satisfy three assumptions on a model for best fit as discussed in Figure 4.9.

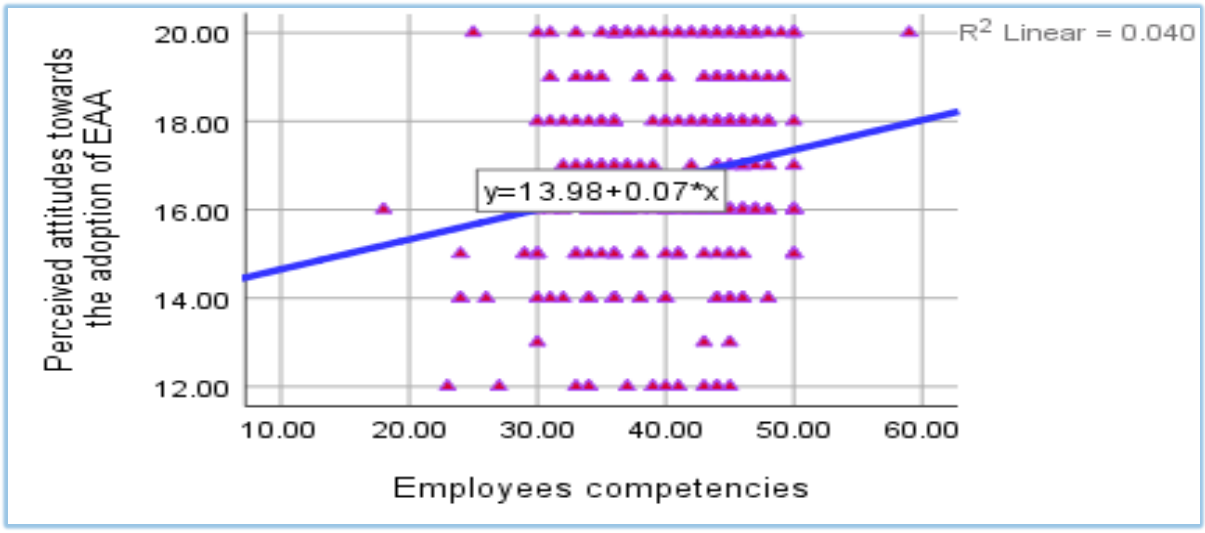


Figure 4.12: Linear Regression Model on Employees' Competencies and Attitudes towards the Adoption of EAA

Source: Author Conceptualisation

The linear regression where $\bar{y}$= 13.98 + 0.07*x. This shows that the slope of +0.07 will bring same increase in $\bar{y}$. The R^2 = 0.040 indicates that the level of variation in the Perceived Attitudes towards the Adoption of EAA could be described by variation in the Employees' Competencies. Similarly, the R^2 is converted to r as thus; $\sqrt{0.040}$ = 0.201 ≈ 0.20, and confirmed in Table 4.25 for Pearson coefficients. This validates that the model is conventional with a positive slope.

4.6 External Factors and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

4.6.1 Pearson Correlation on External Factors

Table 4.28 portrayed on page 135 displays the results on correlations between external factors and Perceived Attitudes towards the Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Perceived Attitudes towards the Adoption of EAA; and independent variable, namely, external factors discussed in Table 4.29.

Table 4.28: Pearson Correlations on External Factors and Perceived Attitudes towards the Adoption of EAA for SCM

Pearson Correlations			
		Perceived Attitudes towards the Adoption of EAA	External factors
Perceived Attitudes towards the Adoption of EAA	Pearson Correlation	1	-.089
	Sig. (2-tailed)		.117
	N	310	310
External factors	Pearson Correlation	-.089	1
	Sig. (2-tailed)	.117	
	N	310	310

Source: Author Conceptualisation

Pearson Correlation Coefficients is -.089, thus indicating that there is a negative relationship between external factors and Perceived Attitudes to the Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between external factors and Perceived Attitudes towards the Adoption of EAA bearing the change of the sign in mind.

4.6.2 ANOVA on External Factors and Perceived Attitudes towards the Adoption of EAA for SCM

Table 4.29 demonstrates the ANOVA results attained for scores on external factors and Perceived Attitudes towards the Adoption of EAA. The dependent variable is regarded as Perceived Attitudes towards the Adoption of EAA and the independent variable is regarded as external factors.

Table 4.29: ANOVA on External Factors

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	26.646	1	26.646	2.466	.117[b]
	Residual	3327.547	308	10.804		
	Total	3354.194	309			
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA						
b. Predictors: (Constant), External factors						

Source: Author Conceptualisation

The general F-statistic is significant ($F = 2.466$, $p < .001$), which implies that the overall model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Meanwhile the exact significance level is $.001 < \alpha$ at .05 the results are statistically significant. The H_{a2} that "external factors affect Perceived Attitudes towards the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{03} that

“external factors does not affect Perceived Attitudes towards the Adoption of EAA for SCM in SMEs” is rejected.

4.6.3 Pearson Coefficients on External Factors and Actual Adoption of EAA

Table 4.30 presents the coefficients results for external factors and Perceived Attitudes towards the Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.6 and Figure 4.6).

Table 4.30: Pearson Coefficients on External Factors and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	9.696	.955		10.157	.000		
	External factors	-.053	.034	-.089	-1.570	.117	1.000	1.0
a. Dependent Variable: Perceived Attitudes towards the Adoption of EAA								

Source: Author Conceptualisation

In conditions where the projected Ý is comprised of Perceived Attitudes towards the Adoption of EAA and external factors with the score = 9.696 - .053, then the t-test shows that the Ý constant a = 9.696 and the Ý constant b = -.053 are significantly different from zero. The independent t-test could be used to regulate the confidence interval of the coefficient, in case the 95% confide]nce interval for the t-test is [10.157, -1.570].

4.6.4 Liner Regression Model on External Factors and Perceived Attitudes towards the Adoption of EAA for SCM

From the data in Figure 4.13 on page 137 demonstrates that $\bar{y}$ account for y-axis as Perceived Attitudes towards the Adoption of EAA, a = y-axis intercept, -b and x = x-intercept as external factors. The R^2 value is 0.010 of the variance is being accounted for this scatter plot from the independent variable, namely, external factors.

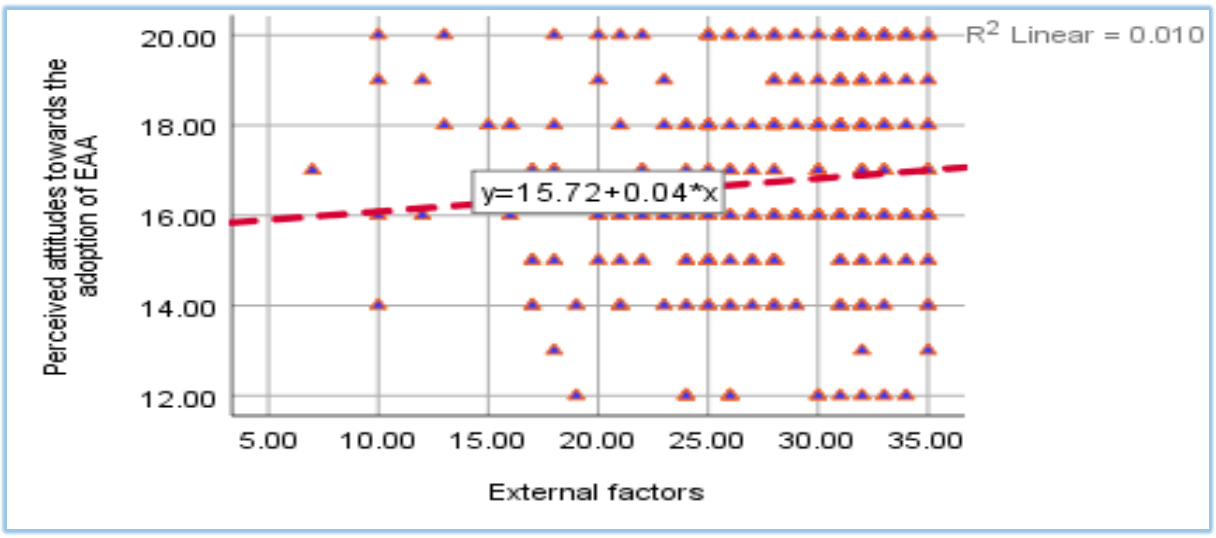


Figure 4.13: Linear Regression Model on External Factors
Source: Author Conceptualisation

The linear regression satisfies three assumptions on a model for best fit as discussed in Figure 4.9. The linear regression where $\bar{y}$ = 15.72 + 0.04*x. This shows that the slope of +0.04 will bring same increase in $\bar{y}$. The R^2 = 0.010 indicates that, the level of variation in the Perceived Attitudes towards the Adoption of EAA could be described by variation in the external factors. Equally, the R^2 is *converted to r as thus*; $\sqrt{0.010}$ = 0.10 (from Table 4.28), where 0.98 ≈ 0.10 for Pearson coefficients. This corroborates that the model is predictable with a positive slope.

4.7 Perceived Attitudes towards the Adoption of EAA

4.7.1 Pearson Correlations on Perceived Attitudes and Actual Adoption of EAA

Table 4.31 indicated on page 138 presents the results on correlations between Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and independent variable, namely, Perceived Attitudes towards the Adoption of EAA discussed in Table 4.32.

Table 4.31: Pearson Correlations on Perceived Attitudes and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	Perceived Attitudes towards the Adoption of EAA
Actual Adoption of EAA	Pearson Correlation	1	-.225**
	Sig. (2-tailed)		.000
	N	310	310
Perceived Attitudes towards the Adoption of EAA	Pearson Correlation	-.225**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is -.225, thus indicating that there is a negative relationship between Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA for SCM in SMEs. The findings on association suggest that, in general, there is a negative relationship between Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA for SCM in SMEs, bearing the change of the sign in mind.

4.7.2 ANOVA on Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA

Table 4.32 shows the ANOVA results attained for scores on Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA. The dependent variable is regarded as the Actual Adoption of EAA and the independent variable is regarded as Perceived Attitudes towards the Adoption of EAA.

Table 4.32: ANOVA on Perceived Attitudes and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	181.535	1	181.535	16.441	.000[b]
	Residual	3400.736	308	11.041		
	Total	3582.271	309			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), Perceived Attitudes towards the adoption of EAA						

Source: Author Conceptualisation

The general F-statistic is significant ($F = 16.441$, $p < .001$), thus signifying that, overall, the model is responsible for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is $.001 < \alpha$ at .05 the results

are statistically significant. The alternativeH_{a3} that “Perceived Attitudes affect Perceived Attitudes towards the Adoption of EAA for SCM in SMEs” is accepted, whilst the sub-H_{03} that “Perceived Attitudes does not affect the Adoption of EAA for SCM in SMEs” is rejected.

4.7.3 Pearson Coefficients on Perceived Attitudes and Actual Adoption of EAA

Table 4.33 presents the coefficients results for Perceived Attitudes towards on the Adoption of EAA and Actual Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.7 and Figure 4.7).

Table 4.33: Pearson Coefficients on Perceived Attitudes and Adoption of EAA

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	25.80	.508		50.7	.00		
	Perceived Attitudes towards the Adoption of EAA	-.233	.057	-.225	-4.08	.00	1.000	1.0
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

In positions where the appraised Ý is comprised of Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA with the score = 25.804 – 0.233*, then the t-test shows that the Ý constant a = -2.33 and the Ý constant b = 25.804 are significantly different from zero. The independent t-test could be used to regulate the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [50.795, -4.087].

4.7.4 Linear Regression on Perceived Attitudes towards the Adoption of EAA and Actual Adoption of EAA

The results on $\bar{y}$ = Actual Adoption of EAA is demonstrated in Figure 4.15 on page 140 where; a = y-axis intercept, b = slope and x-axis intercept as Perceived Attitudes towards the Adoption of EAA. The R^2 value is 0.051 of the variance is being accounted for this scatter plot from the independent variable, namely, Perceived Attitudes towards the Adoption of EAA. The negative linear regression does not satisfy three assumptions on a model for best fit discussed in Figure 4.10.

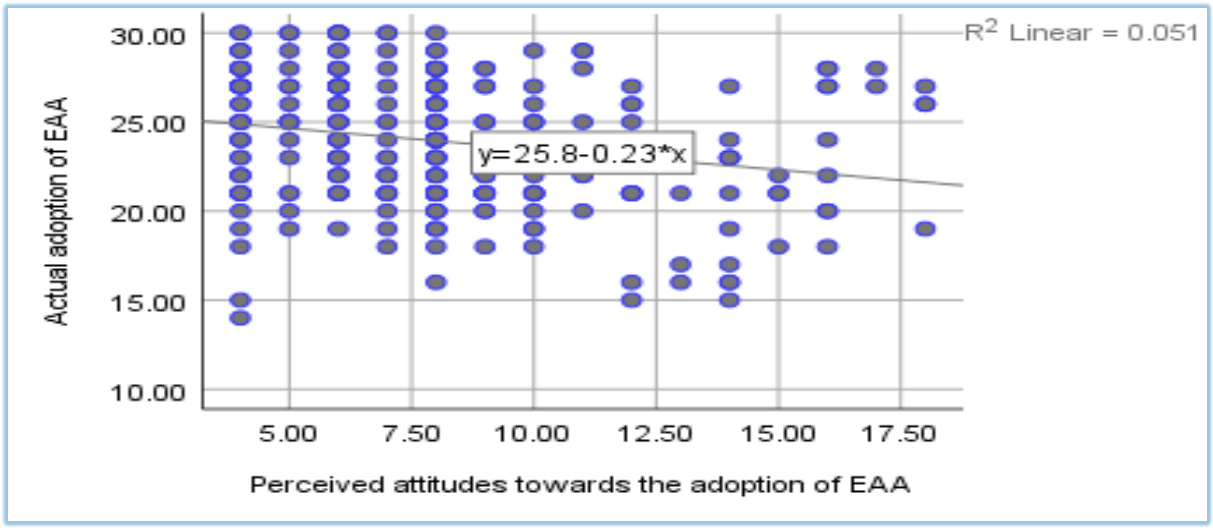


Figure 4.14: Linear Regression Model on Intention to Use EAA and Perceived Attitude Actual Adoption of EAA

Source: Author Conceptualisation

The linear regression where; $\bar{y}$ = 25.8-0.23*x. The b=-0.23 will bring same decrease in $\bar{y}$. The R22 = 0.051 indicates that, the level of variation in the prognostic variable could be described by variation in the independent variables. Likewise, the R2 is converted to r as thus; $\sqrt{0.051}$ = 0.225 ≈ -0.225, which is confirmed in Table 4.31 for Pearson Correlation Coefficients. This endorses that the model is inadequate with negative slope and meet the requirements for model best fit.

4.8 Descriptive Statistics for All Variables and Actual Adoption of EAA for SCM in SMEs

4.8.1 Internal Factors and Actual Adoption of EAA for SCM in SMEs

4.8.1.1 Owners' Characteristics and Actual Adoption of EAA

4.8.1.1.1 Pearson Correlations on Owners' Characteristics and Actual Adoption of EAA

Table 4.34 displayed on page 141 demonstrates the results on correlations between Owners' Characteristics and Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and the independent variable, namely, Owners' Characteristics discussed in Table 4.35.

Table 4.34: Pearson Correlations on Owners' Characteristics and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	Owners' Characteristics
Actual Adoption of EAA	Pearson Correlation	1	.185**
	Sig. (2-tailed)		.001
	N	310	310
Owners' Characteristics	Pearson Correlation	.185**	1
	Sig. (2-tailed)	.001	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .185, thus indicating that there is a positive relationship between Owners' Characteristics and Actual Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between Owners' Characteristics and Actual Adoption of EAA bearing the change of the sign in mind.

4.8.1.1.2 ANOVA on Owners' Characteristics and Actual Adoption of EAA

Table 4.35 shows the ANOVA results attained for scores on Owners' Characteristics and Actual Adoption of EAA. The independent variable is regarded as Owners' Characteristics and the dependent variable is regarded as Actual Adoption of EAA.

Table 4.35: ANOVA on Owners' Characteristics and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122.708	1	122.708	10.925	.001[b]
	Residual	3459.563	308	11.232		
	Total	**3582.271**	**309**			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), Owners' Characteristics						

Source: Author Conceptualisation

The general F-statistic is significant ($F = 10.925$, $p < .001$), thus signifying that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is $.001 < \alpha$ at .05 the results are statistically significant. The alternative sub-H_{a1} that; "Owners' Characteristics affect the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{01} that; "Owners' Characteristics does not affect the adoption of EAA for SCM in SMEs" is rejected.

4.8.1.1.3 Pearson Coefficient on Owners' Characteristics and Actual Adoption of AA

Table 4.36 presents the coefficients results for Owners' Characteristics and Actual Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean (confirmed in Table 4.8 and Figure 4.8).

Table 4.36: Pearson Coefficients on Owners' Characteristics and Actual Adoption of EAA

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	td. Error	Beta			Tolerance	B
1	(Constant)	19.486	1.346		14.47	1		
	Owners' Characteristics	.193	.058	.185	3.327	.001	1.000	1.0
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

In conditions where the predicted Ý consists of Perceived Attitudes towards the Adoption of EAA and Owners' Characteristics with the score = 19.486 + 0.193*, then the t-test shows that the Ý constant a = 0.193 and the Ý constant b = 119.486 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [14.476, 3.327].

4.8.1.1.4 Linear Regression on Owners' Characteristics and Actual Adoption of EAA

Figure 4.15 indicates the results on ȳ = assembled as Actual Adoption of EAA, where;

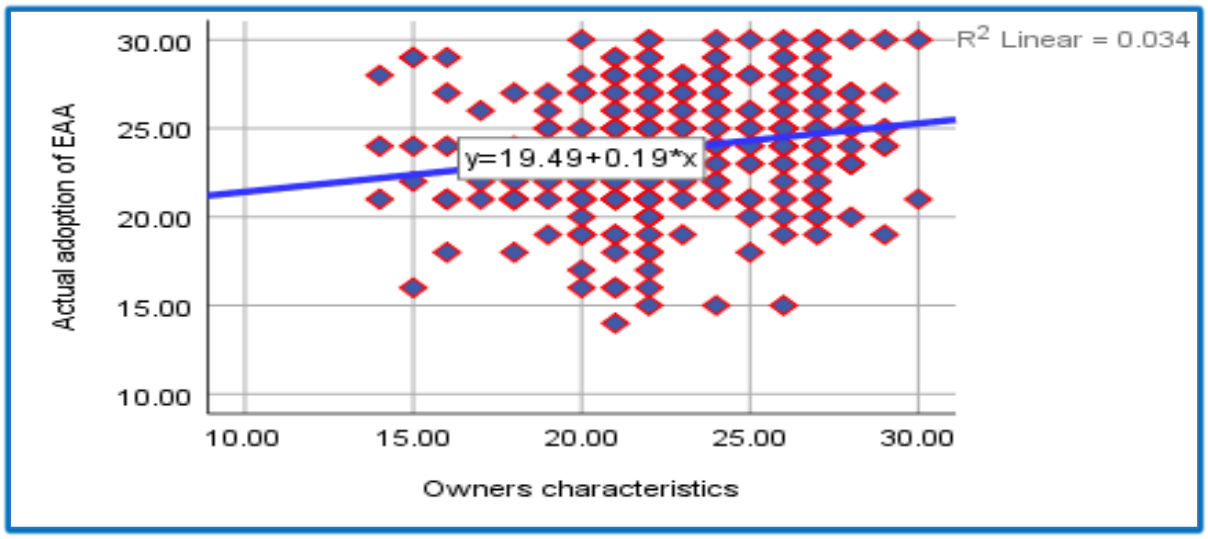


Figure 4.15: Linear Regression Model on Owners' Characteristic and Actual Adoption of EAA
Source: Author Conceptualisation

a = y-axis intercept, b = + slope and x-axis intercept as Owners' Characteristics. The R^2 value is 0.034 of the variance is being accounted for this scatter plot from the independent variable, namely, Owners' Characteristics. The positive linear egression satisfy three assumptions on a model for best fit discussed in Figure 4.10. The linear regression where; $\bar{y}$ = 19.48 + 0.19*x. The slope of +0.19 will bring same increase in $\bar{y}$. The R^2 = 0.034 indicates that, the level of variation in the prognostic variable could be described by variation in the independent variables. Moreover, the R^2 is converted to r as thus; $\sqrt{0.034}$ = 0.184 ≈ 0.185which is confirmed in Table 4.34 for Pearson Correlation Coefficients. This validates that the model is adequate with positive slope and the model is of a positive fit.

4.8.1.2 Enterprise Resources and Actual Adoption of EAA

4.8.1.2.1. Pearson Correlations on Enterprise Resources and Actual Adoption of EAA

Table 4.37 shows the results on correlations between Enterprise Resources and Actual Adoption of EAA.]The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and the independent variable, namely, Enterprise Resources, discussed in Table 4.38.

Table 4.37: Pearson Correlations on Enterprise Resources and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	Enterprise Resources
Actual Adoption of EAA	Pearson Correlation	1	.317**
	Sig. (2-tailed)		.000
	N	310	310
Enterprise Resources	Pearson Correlation	.317**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .317, thus indicating that there is a positive relationship between Enterprise Resources and actual adoption of EAA. The findings on association suggest that in general there is a positive relationship between external factors and Actual Adoption of EAA bearing the change of the sign in mind.

4.8.1.2.2 ANOVA on Enterprise Resources and Actual Adoption of EAA

Table 4.38 that indicates the ANOVA results attained for scores on Enterprise Resources and Actual Adoption of EAA. The independent variable is regarded as

Table 4.38: ANOVA on Enterprise Resources and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	360.524	1	360.524	34.466	.000[b]
	Residual	3221.747	308	10.460		
	Total	**3582.271**	**309**			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), Enterprise Resources						

Source: Author Conceptualisation

Enterprise Resources and the independent variable is regarded as Actual Adoption of EAA. The general F-statistic is significant ($F = 34.466$, $p < .001$), thus signifying that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is $.001 < \alpha$ at .05 the results are statistically significant. The alternative sub-H_{a2} that; "Enterprise Resources affect the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{02} that "Enterprise Resources do not affect the adoption of EAA for SCM in SMEs" is rejected.

The results indicate that there is a strong positive relationship between Owners' Characteristics and Perceived Attitudes the Adoption of EAA in SCM for SMEs, which is above the cut-off point at +1. The actual Correlation Coefficient is at 0.215, thus indicating that there is strength of the $\bar{y}$ variables between Owners' Characteristics and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs. The findings on correlation suggest that, in general, there is a positive relationship between Owners' Characteristics and Perceived Attitudes towards the Adoption of EAA for SCM in SMEs.

4.8.1.2.3 Coefficients on Enterprise Resources and Actual Adoption of EAA

Table 4.39 presents the coefficients results for Enterprise Resources and Actual Adoption of EAA as indicated on page 145. The t-test is considered for testing as both samples have similar values in the mean.

Table 4.39: Pearson Coefficient on Enterprise Resources and Actual Adoption of EAA

Pearson Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	B
1	(Constant)	17.83	1.047		17.03	.000		
	Enterprise Resources	.259	.044	.317	0.588	.000	1.000	1.000
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

In situations where the foreseen Ý consists of Perceived Attitudes towards the Adoption of EAA and Enterprise Resources with the score = 17.838 + 0.044*, then the t-test shows that the Ý constant a = 0.259 and the Ý constant b = 17.838 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [17.037, 0588].

4.8.1.2.4 Linear regression on Enterprise Resources and Actual Adoption of EAA

Figure 4.16 below summaries the distinct characters on the results for Ȳ = Actual Adoption of EAA, where a = y-axis intercept, b = + slope and x-axis intercept as Enterprise Resources. The R^2 value is 0.101 of the variance is being accounted for this scatter plot from the independent variable; Enterprise Resources. The positive linear regression satisfy three assumptions on a model for best fit discussed in Figure 4.10.

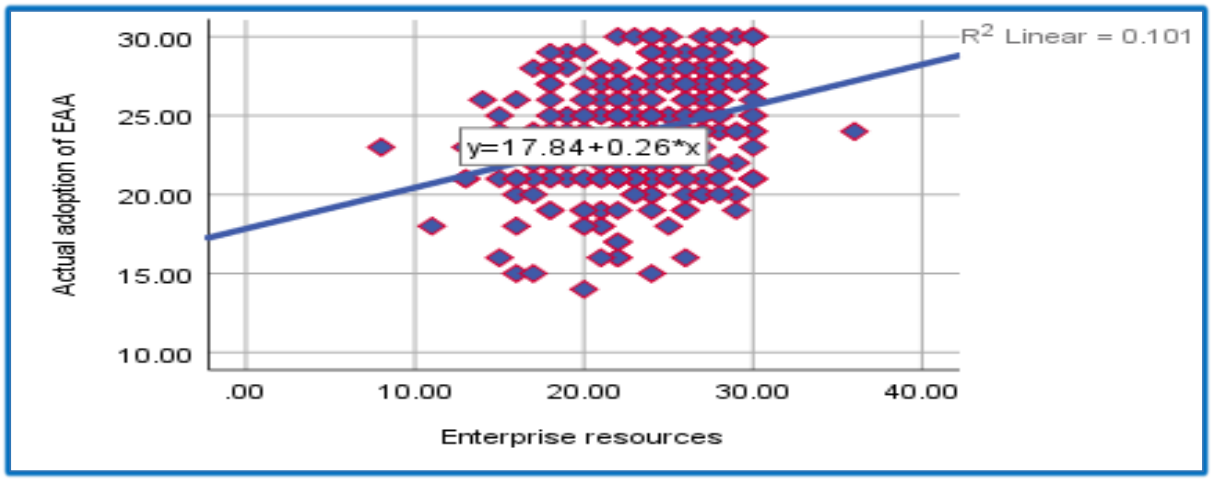


Figure 4.16: Linear Regression Model on Enterprise Resources and Actual Adoption of EAA
Source: Author Conceptualisation

The linear regression where $\bar{y}$= 17.84+0.26*x. The slope of 0.26 will bring same increase in $\bar{y}$. The R2 = 0.101 indicates that the level of variation in the prognostic variable could be described by variation in the independent variables. Moreover, the R2 is converted to r as thus; √0.101 = 0.317, which is confirmed in Table 4.37 for Pearson Correlation Coefficients. This endorses that the model is adequate with positive slope and the model is of a positive fit.

4.8.1.3 Information System Components and Actual Adoption of EAA

4.8.1.3.1 Pearson Correlations on Information System Components and Actual Adoption of EAA

Table 4.40 demonstrates the results on correlations between Information System Components and Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and independent, namely, variable Information System Components discussed in Table 4.41.

Table 4.40: Pearson Correlations on Information System Components and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	Information System Components
Actual Adoption of EAA	Pearson Correlation	1	.260**
	Sig. (2-tailed)		.000
	N	310	310
Information System Components	Pearson Correlation	.260**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .260, thus indicating that there is a positive relationship between Information System Components and Actual Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between Information System Components and Actual Adoption of EAA bearing the change of the sign in mind.

4.8.1.3.2 ANOVA on Information System Components and Actual Adoption of EAA

Table 4.41 indicates the ANOVA results attained for scores on Information System Components and Actual Adoption of EAA. The independent variable is regarded as Information System Components and the dependent variable is regarded as Actual Adoption of EAA.

Table 4.41: ANOVA on Information System Components and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	241.405	1	241.405	22.256	.000[b]
	Residual	3340.866	308	10.847		
	Total	3582.271	309			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), Information System Components						

Source: Author Conceptualisation

The general F-statistic is significant (F= 22.256, p < .001), thus signifying that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is .001 < α at .05 the results are statistically significant. The alternative sub-H_{a3} that; "Information System Components affect the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{03} that; "Information System Components does not affect the adoption of EAA for SCM in SMEs" is rejected.

4.8.1.3.3 Pearson Coefficients on Information System Components and Actual Adoption of EAA

Table 4.42 presents the coefficients results for Information System Components and Actual Adoption of EAA. The t-test is considered for testing as both samples have

Table 4.42: Pearson Coefficients on Information System Components and Actual Adoption of EAA

Pearson coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	B
1	(Constant)	18.235	1.213		15.02	.00		
	Information System Components	.235	.050	.260	4.718	.00	1.000	1.00
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

similar values in the mean. In conditions where the predicted Ý consists of Perceived Attitudes towards the Adoption of EAA and Information System Components with the score = 18.235 + 0.235*, then the t-test shows that the Ý constant a = 0.235 and the Ý constant b = 18.235 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [15.029, 4.718].

4.8.1.3.4 Linear Regression on Information System Components and Actual Adoption of EAA

Figure 4.17 summaries different characters on the results for ȳ = Actual Adoption of EAA, where; a = y-axis intercept, b = + slope and x-axis intercept as Information System Components. The R^2 value is 0.101 of the variance is being accounted for this scatter plot from the independent variable; Enterprise Resources.

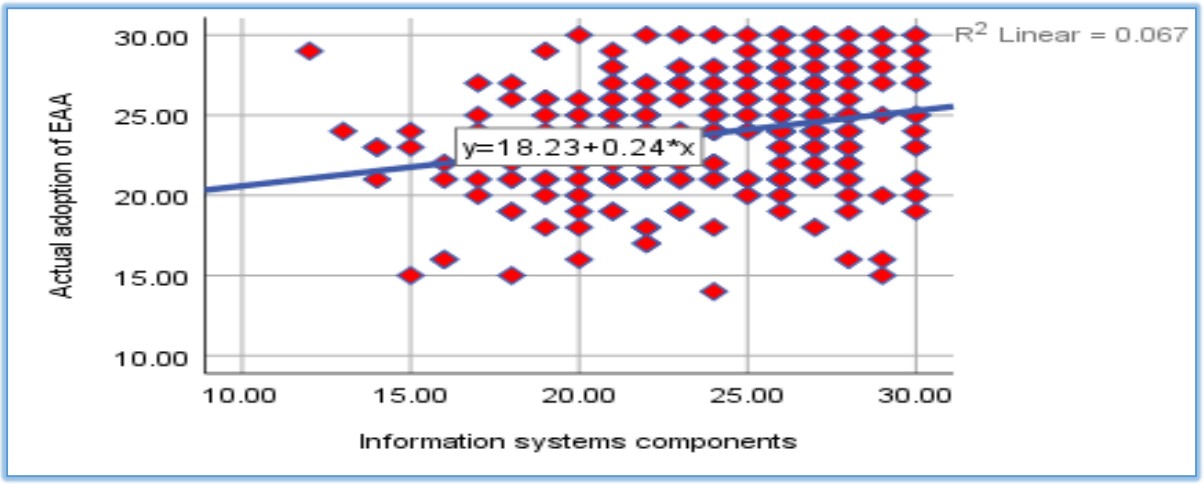


Figure 4.17: Linear Regression Model on Information System Components and Actual Adoption of EAA
Source: Author Conceptualisation

The positive linear regression satisfy three assumptions on a model for best fit discussed in Figure 4.10. The linear regression where; Y= 18.23 + 0.24*x. The slope of +0.24 will bring same increase in ȳ. The R^2 = 0.067 indicates that, the level of variation in the prognostic variable could be described by variation in the independent variables. Moreover, the R^2 is converted to r as thus; √0.067 = 0.258 which is ≈ 0.260 confirmed in Table 4.40 for Pearson Correlation Coefficients. This endorses that the model is adequate with positive slope and the model is of a positive fit.

4.4.1.4 Employees' Competencies and Actual Adoption of EAA

4.8.1.4.1 Pearson Correlations on Employees' Competencies and Actual Adoption of EAA

Table 4.43 shows the results on correlations between Employees' Competencies and Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" was used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and independent variable, namely, Employees' Competencies discussed in Table 4.44.

Table 4.43: Pearson Coefficients on Employees' Competencies and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	Employees' Competencies
Actual Adoption of EAA	Pearson Correlation	1	.346**
	Sig. (2-tailed)		.000
	N	310	310
Employees' Competencies	Pearson Correlation	.346**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .346, thus indicating that there is a positive relationship between Employees' Competencies and Actual Adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between Employees' Competencies and Actual Adoption of EAA bearing the change of the sign in mind.

4.8.1.4.2 ANOVA on Employees' Competencies and Actual Adoption of EAA

Table 4.44 on page 150 indicates that the ANOVA results attained for scores on Employees' Competencies as independent variables and Actual Adoption of EAA as dependent

Table 4.44: ANOVA on Employees' Competencies and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	429.298	1	429.298	41.936	.000[b]
	Residual	3152.973	308	10.237		
	Total	3582.271	309			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), Employees' Competencies						

Source: Author Conceptualisation

variable. The general F-statistic is significant (F = 41.936, p < .001), thus signifying that, overall, that the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. Since the exact significance level is .001 < α at .05, the results are statistically significant. The alternative sub-H_{a4} that; "Employees' Competencies affect the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{04} that "Employees' Competencies does not affect the adoption of EAA for SCM in SMEs" is rejected.

4.8.1.4.3 Pearson Correlation on Employees' Competencies and Actual Adoption of EAA

Table 4.45 presents the coefficients results for Employees' Competencies and Actual Adoption of EAA. The t-test is considered for testing as both samples have similar values in the mean.

Table 4.45: Pearson Correlations on Employees' Competencies and Actual Adoption of EAA

Pearson Correlations								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	B
1	(Constant)	16.120	1.214		13.278	.00		
	Employees' Competencies	.190	.029	.346	6.551	.00	1.000	1.000
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

In conditions where the estimated Ý consists of Perceived Attitudes towards the Adoption of EAA and Employees' Competencies with the score = 16.120 + 0.190*, then the t-test shows that the Ý constant a=16.120 and the Ý constant b=0.190 are significantly different from zero. The independent t-test could be used to determine the

confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [13.278, 6.551]. The results on coefficient state that there is a positive correlation between Employees' Competencies and the Actual Adoption of EAA.

4.8.1.4.4 Linear Regression on Employees' Competencies and Actual Adoption of EAA

As demonstrated, Figure 4.18provides summaries on different characters where; $\bar{y}$ = Actual Adoption of EAA, a = y-axis intercept as Actual Adoption of EAA, b = + slope and x-axis intercept as Employees' Competencies. The R^2 value is 0.120 of the variance is being accounted for this scatter plot from the independent variable; Employees' Competencies. The positive linear regression satisfy three assumptions on a model for best fit discussed in Figure 4.10.

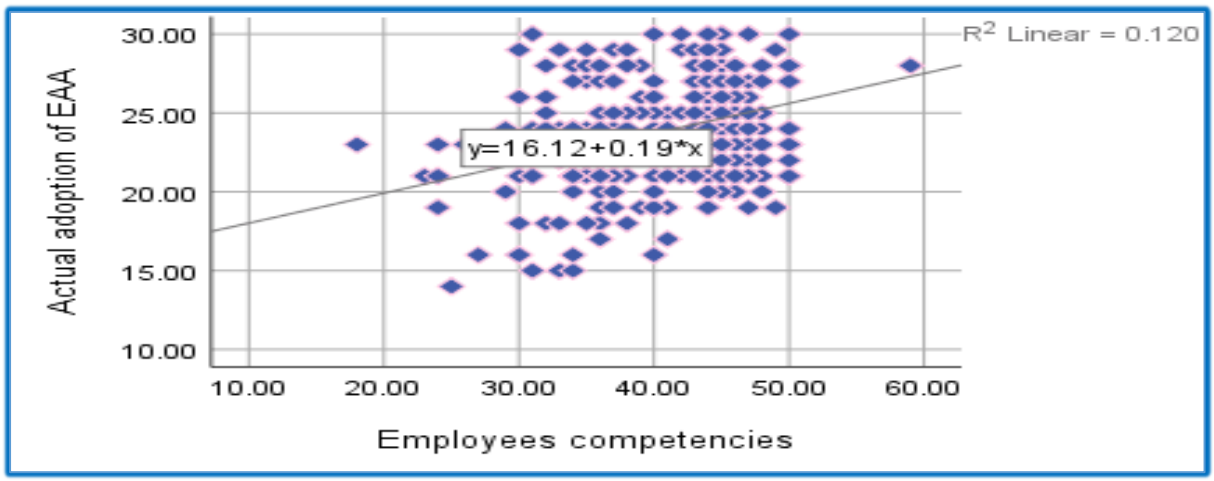


Figure 4.18: Linear Regression Model on Employees
Source: Author Conceptualisation Competencies and Actual Adoption of EAA

The linear regression where $\bar{y}$ = 16.12+0.19*x. The slope of +0.19 will bring same increase in $\bar{y}$. The R^2 = 0.120 indicates that, the level of variation in the prognostic variable could be described by variation in the independent variables. Moreover, the R^2 is converted to r as thus; $\sqrt{0.120}$ = 0.346, which is confirmed in Table 4.43 for Pearson Correlation Coefficients. This approves that the model is adequate with positive slope and the model is of a positive fit.

4.8.2 External Factors and Actual Adoption of EAA

4.8.2.1 Pearson Correlations on External Factors and Actual Adoption of EAA

Table 4.46 provides the results on correlations between external factors and Actual Adoption of EAA. The p-value is near zero at "<.001" with the required value set at 0.05. The statistical technique "ANOVA" is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA and the independent variable, namely, external factors discussed in Table 4.47.

Table 4.46: Pearson Correlation on External Factors and Actual Adoption of EAA

Pearson Correlations			
		Actual Adoption of EAA	External factors
Actual Adoption of EAA	Pearson Correlation	1	.239**
	Sig. (2-tailed)		.000
	N	310	310
External factors	Pearson Correlation	.239**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .329, thus indicating that there is a positive relationship between external factors and actual adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between external factors and Actual Adoption of EAA bearing the change of the sign in mind.

4.8.2.2 ANOVA on External Factors and Actual Adoption of EAA

Table 4.47 that displays the ANOVA results attained for scores on external factors and Actual Adoption of EAA. The dependent variable is regarded as the Actual Adoption of EAA and the independent variable is regarded as external factors.

Table 4.47 ANOVA on External Factors and Actual Adoption of EAA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	204.167	1	204.167	18.615	.000[b]
	Residual	3378.104	308	10.968		
	Total	3582.271	309			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), External factors						

Source: Author Conceptualisation

The general F-statistic is significant (F = 18.615, p < .001), thus signifying that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. The alternative-H_{a3} that; “external factors affect the adoption of EAA for SCM in SMEs” is accepted, whilst the null-H_{03}that; “external factors do not affect the adoption of EAA for SCM in SMEs” is rejected.

4.8.2.3 Pearson Coefficients on External Factors and Actual Adoption of EAA

Table 4.48 presentsindicationon the results for coefficient between external factors and Actual Adoption of EAA. The p-value is .000 ≈ .001 whilst Pearson coefficients is .239, thus indicating that there is a positive relationship between external factors and Actual Adoption of EAA, which is below the cut-off point at 1.

Table 4.48: Pearson Coefficients on External Factors and Actual Adoption of EAA

Model								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	B
1	(Constant)	19.821	.962		20.603	.00		
	External factors	.146	.034	.239	4.294	.00	1.000	1.000
a. Dependent Variable: Actual Adoption of EAA								

Source: Author Conceptualisation

In conditions where the estimated Ý consists of Perceived Attitudes towards the Adoption of EAA and external factors with the score = 19.821 + 0.146 then the t-test shows that the Ý constant a = 19.821 and the Ý constant b=0.146 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [20.603, 4.294]. The results on coefficient state that there is a positive correlation between external factors and the Actual Adoption of EAA.

4.8.2.4 Linear Regression on External Factors and Actual Adoption of EAA

Figure 4.19 on page 154 projects summaries on different characters where; $\bar{y}$ = Actual Adoption of EAA, a = y-axis intercept, b = + slope and x-axis intercept as external factors. The R^2 value is 0.057 of the variance is being accounted for this scatter plot from the independent variable; external factors.

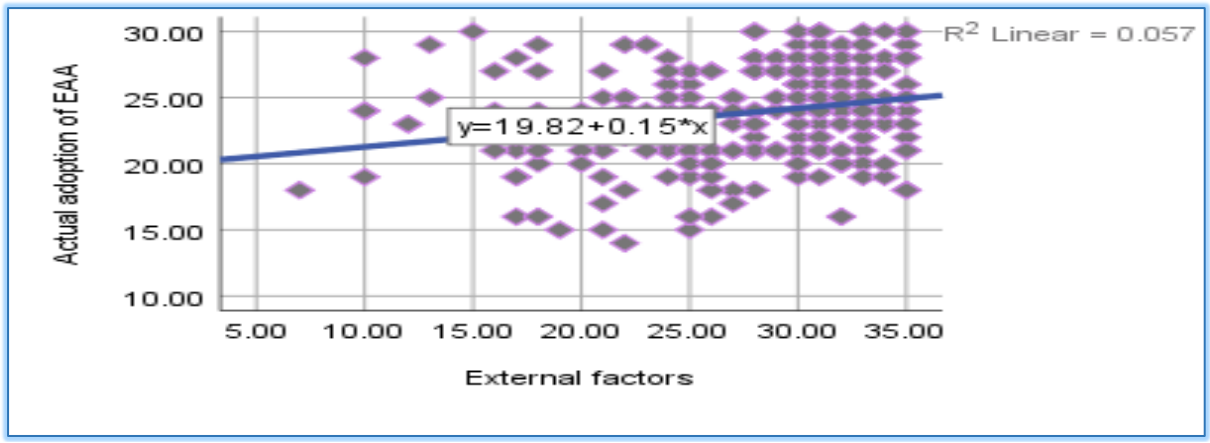


Figure 4.19: Linear Regression Model on External Factors and Actual Adoption of EAA
Source: Author Conceptualisation

The positive linear regression satisfies three assumptions on a model for best fit discussed in Figure 4.10. The linear regression where Y = 19.82+0.15*x. The slope of 0.15 will bring same increase in Y. The R^2 = 0.057 indicates that, the level of variation in the prognostic variable could be described by variation in the independent variables. Moreover, the R^2 is converted to r as thus; $\sqrt{0.057} = 0.238$ which is ≈ 0.239 confirmed in Table 4.46 for Pearson Correlation Coefficients. This approves that the model is adequate with positive slope and the model is of a positive fit.

4.9 Multiple Regression Analysis

The under standardised predictive score (PRE_1) is derived from the regression equation which, is based on the unstandardized slopes from Figure 4.21. The relationship between the unpredicted value and the actual dependent variables correspond the model. The predictive variables were used to predict the PRE_1, which includes internal factors with sub-variable, namely, Owners' Characteristics, Enterprise Resources and Information System Components; external factors; and Perceived Attitudes towards the Adoption of EAA. The Multiple linear Regression is based on four assumptions that the model is correctly specified as based on truthful conditional probabilities that are a logistic function of the independent variables; without the omission of important variables; none of extraneous variables are included; and the independent variables are dignified without any errors; last but not least, that independent variables are not linear combinations of each other.

4.9.1 Descriptive Statistics on Actual Adoption of EAA and Unstandardized Predictive Value

Table 4.49 presents the descriptive statistics results on actual adoption and the PRE_1 outcomes on unstandardized slopes that includes, internal factors with its sub-variables, external factors and Perceived Attitudes towards the Adoption of EAA for SCM. The *n* is highlighted at 310, with a σ of 3.40487 and 1.44190782 for Actual Adoption of EAA and PRE_1, chronologically, with equal mean of 23.8903. This means that the level of deviation is below the cut-off point at 0.05. Therefore, further statistical tests, such as multilinear regression, could be tested.

Table 4.49 Descriptive statistics on Actual Adoption of EAA and PRE_1

Descriptive Statistics			
	Mean	Std. Deviation	N
Actual Adoption of EAA	23.8903	3.40487	310
PRE_1	23.8903226	1.44190782	310

Source: Author Conceptualisation

The measure of central tendency is identical at 23.8903 for both Actual Adoption of EAA and PRE_1. Despite its empirical nature, this study provides some insight into a statistical analysis on the Actual Adoption of EAA and the PRE_1 that might provide positive results for further statistical review on Multilinear Regression Model on the adoption of EAA for SCM in SMEs.

4.9.2 Pearson Correlations on Actual Adoption of EAA and PRE_1

Table 4.50 indicated on page 156 presents the results on correlations between Actual Adoption of EAA and PRE_1. In this regard, all predictors contribute substantially for predicting the Actual Adoption of EAA for SCM in SMEs. The correlations provides the empirical evidence that all predictors correlates statistically and significantly with the outcome variable. Nonetheless, there is also considerable correlations among the predictors themselves, that they accounted by a predictor. The p-value is near zero at “<.398” with the required value set between .30 and .70. The statistical technique “ANOVA” is used to test the hypotheses between the dependent variable, namely, Actual Adoption of EAA for SCM in SMEs and the independent variable, namely, PRE_1 discussed in Table 4.51.

Table 4.50: Pearson Correlations on Actual Adoption of EAA and PRE_1

Pearson Correlations			
		Actual Adoption of EAA	PRE_1
Actual Adoption of EAA	Pearson Correlation	1	.398**
	Sig. (2-tailed)		.000
	N	310	310
PRE_1	Pearson Correlation	.398**	1
	Sig. (2-tailed)	.000	
	N	310	310
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Conceptualisation

Pearson Correlation Coefficients is .398, thus indicating that there is a positive relationship between PRE_1 and actual adoption of EAA. The findings on association suggest that, in general, there is a positive relationship between PRE_1 and Actual Adoption of EAA.

4.9.3 ANOVA between Actual Adoption of EAA and PRE_1

Table 4.51 exhibits the ANOVA results attained for scores on Actual Adoption of EAA and PRE_1. The dependent variable is regarded as the Actual Adoption of EAA

Table 4.51: ANOVA between Actual Adoption of EAA and PRE_1

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	566.070	1	566.070	57.804	.000[b]
	Residual	3016.201	308	9.793		
	Total	3582.271	309			
a. Dependent Variable: Actual Adoption of EAA						
b. Predictors: (Constant), PRE_1						

Source: Author Conceptualisation

and the independent variable is regarded as PRE_1. The general F-statistic is significant ($F = 57.804$, $p < .001$), thus signifying that, overall, the model accounts for a significant proportion of the variation in the adoption of EAA for SCM in SMEs. The alternative sub-H_{a4} that; "PRE_1 affect the adoption of EAA for SCM in SMEs" is accepted, whilst the sub-H_{04} that; "PRE_1 does not affect the adoption of EAA for SCM in SMEs" is rejected.

4.9.4 Coefficients between Actual Adoption of EAA and PRE_1

Table 4.52 indicated on page 157 presents signal on the results for coefficient between Actual Adoption of EAA and PRE_1. The p-value is 1.000 whilst Pearson coefficients

is .398, thus indicating that there is a positive relationship between Actual Adoption of EAA and PRE_1, which is below the cut-off point at 1.

Table 4.52: Coefficients between Actual Adoption of EAA and PRE_1

Coefficients									
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Parc-tial	Part
1	(Constant)	3.553E-15	3.147		.00	1.00			
	PRE_1	1.000	.132	.398	7.6	.000	.398	.398	.398
a. Dependent Variable: Actual Adoption of EAA									

Source: Author Conceptualisation

This indicates that the null hypotheses "that the PRE_1 does not affect Perceived Attitudes towards the adoption of EAA" is rejected. In instances where the estimated Ý consists of Actual Adoption of EAA and PRE-1 with the score = 3.553E-15 + 1.000, then the t-test shows that the Ý constant a=3.553E-15 and the Ý constant b=1.000 are significantly different from zero. The independent t-test could be used to determine the confidence interval of the coefficient, in case the 95% confidence interval for the t-test is [7.603]. The results on coefficient state that there is a positive correlation between the Actual Adoption of EAA and PRE_1.

4.9.5 Multiple Linear Regression Model

Figure 4.16 indicated on page 158 presents the results on multiple regression analysis between Actual Adoption of EAA and PRE_1. There is a clear confirmation that provides the coefficient of determination, R^2, which is the square of the Pearson Correlation Coefficient *r* is significant, where R^2 = 0.158 with the confidence level of 95.0%. The value created is greater than 0 and that implies a positive association; that is, as the value on PRE_1increases cause an increase in the value for Actual Adoption of EAA.

The R^2 is at 0.158 which is greater than zero as a sign of positive associations between Actual Adoption of EAA and the PRE_1. Special effects as conclusions are illustrated in a Linear Regression Model, which is enclosed of Actual Adoption of EAA as dependent variable (y-axis), PRE_1 is regarded as independent variable (x-axis), a as

the y-axis intercept and the slope (b). Confirmed in the regression line as $\bar{y}$ = a + bx, where y-dependent variable as Actual Adoption of EAA and x as PRE_1, which predicts the reliable values of y as $\bar{y}$ = 2.49E - 14 + 1*x.

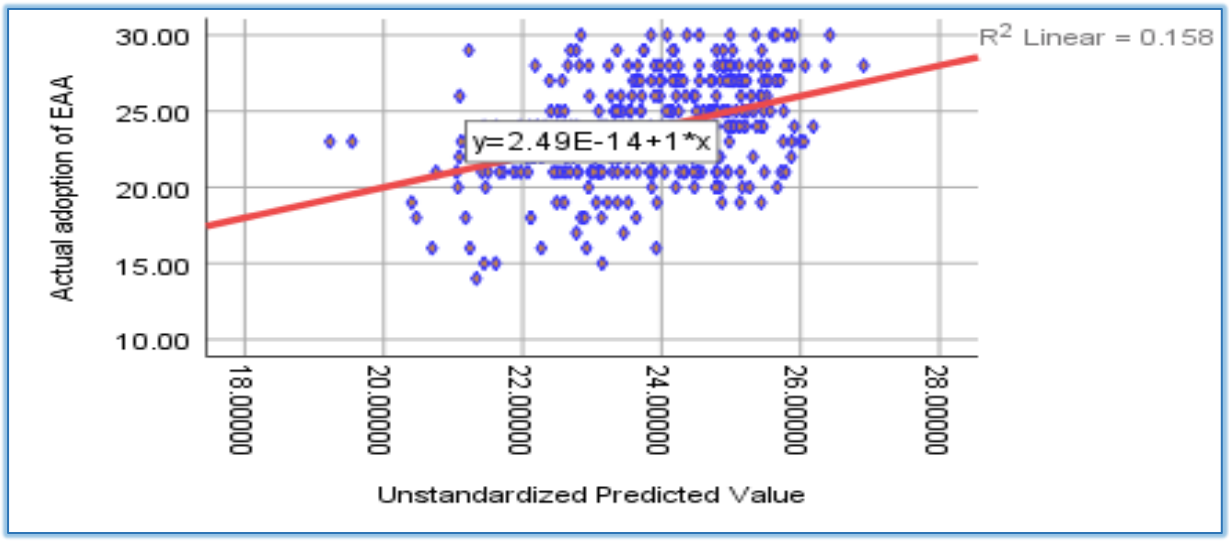


Figure 4.20: Linear Regression on Actual Adoption of EAA and Unstandardized Predictive Value

Source: Author Conceptualisation

The applicability of PRE_1 originated as it established a programmed positive growth on the Actual Adoption of EAA as it is apparent in the Multiple Linear Regression and scatterplot that conveyed a negative slope of the amount of variation rationalised by the correlation model. The model satisfied the assumptions discussed in 4.9. Moreover, the R^2 is *converted to r as thus*; $\sqrt{0.158} = 0.397$ which is ≈ 0.398 confirmed in Table 4.50 for Pearson Correlation Coefficients. This approves that the model is adequate with positive slope and the model is of a positive fit.

4.9.6 Regression Analysis

The test for addition of group of variables of interest provided significant increase to the predictions of the output denoted as '' $\bar{y}$''. As it was determined that at least one of the regressors brings a significant change, it is important to consider the fact that an increase in error variables permits an increase in the regression sums of squares. Multiple linear regression where y is Perceived Attitudes towards the Adoption of EAA.

$\bar{y}$ = a + bx

$$\bar{y} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon$$

$$\bar{y} = 19.49x_6 + 17.84x_6 + 18.23x_6 + 16.12x_6 + 19.82x_6 + \varepsilon$$

Where;

$\bar{y}$ = dependent variable: the y is the predicted variable in the model. It is plotted on the vertical axis of a scatterplot.

a = intercept. This is the point at which the regression line crosses the vertical (Y) axis. Strictly speaking this gives

b = regression Pearson Correlation Coefficients. It is also known as the slope and it shows the average change in the Y variable (outcome) for a unit change in the X variable (predictor/explanatory variable).

x = independent variable: the independent variable is used to make forecast about the values of the response variable located on the horizontal axis of a scatter plot.

Simplified:

- $\bar{y}$ = Actual Adoption of EAA
- X_1= Owners' Characteristics
- X_2= Enterprise Resources
- X_3= Information System Components
- X_4= Employees' Competencies
- X_5= External factors
- X_6= Perceived Attitudes towards the adoption of EAA

4.1 Conclusion

This chapter presented the research results and findings for the study that are in line with the hypotheses and sub-hypotheses for internal factors, external factors, perceived attitudes, the intention to use EAA and Actual Adoption of EAA. Research instruments such as descriptive statistics, ANOVA, Pearson Correlation and Pearson Coefficients on constructs and Linear Regression Model were used for analysing variables in the form of constructs. Last but not least, the Multinomial Logistic Regression was used to determine Model Summary, Collinearity Diagnostics and Casewise Diagnostics; and regression analysis was used to analyse, compare and make conclusion about all variables to provide joint results.

CHAPTER 5: SUMMARY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The aim of the study was to investigate factors influencing the adoption of EAA for SCM in SMEs within the Capricorn District Municipality. Both internal and external factors together with the Perceived Attitudes towards the Adoption of EAA were aligned and discussed in the conceptual research model. Variables and sub-variables were identified through literature review and later analysed and interpreted in chapter four. The sole intention was to explore new findings, draw conclusions and to make recommendations about internal and external factors impact on the adoption of EAA for SCM in SMEs for future research studies.

5.2 Summary Findings on Internal Factors

The preliminary findings were generated under the guided help of both the supervisor and the co-supervisor, given that they were responsible for the execution of this research report. The researcher relied much upon their professional background and level of expertise with regards to facilitating and overseeing this research project over the previous two years. Its findings are summarised in four all-encompassing categories below.

5.2.1 Summary of Findings for Internal Factors: Owners' Characteristics

Internal factors on Owners' Characteristics were described as assessment of interior dynamics affecting the enterprise, of which the management have a full control over them, such as employees, business culture, norms and ethics, processes and overall functional activities (Voges & Pulakanam; 2011; and Jessee, 2019). In this study, the internal factors included major variables such as Owners' Characteristics, with a number of sub-variables such as passion for enterprise success; creative thinking and mind-set in risk taking; discipline for action orientation; innovation abilities for hard-working; vision oriented; and owner's resilience. Enterprise networks such as personal, social and extended networking in local business areas and professional organisations will help in worthwhile pursuits outside of business working hours through social, personal and extended business networking.

This networking would be possible through business seminars offered by the Small Enterprise Development Agency (SEDA), the Limpopo Economic Development Agency (LEDA), the National Youth Development Agency (NYDA) and many of more. If the enterprise owners would nominate or delegate employees to attend the enterprise seminars and workshops, there will surely have positive attitudes and perspectives towards the adoption of EAA. The Diffusion Theory of Innovation serves as an essential concept in that both the Diffusion Theory of Innovation (DTI) and Technology Acceptance Models focus on improvement of relationships between internal factors and the adoption of EAA, which are improved concepts that replace historical operational systems with entrepreneurial flair in the Fourth Industrial Revolution.

5.2.2 Summary of Findings for Internal Factors: Enterprise Resources

Enterprise Resources were defined as production factors that includes; capital, machinery, equipment and natural resource that provide SMEs with the means to perform its operational activities for SCM (Toor, 2016; and Hersey & Blanchard, 2017). In this study, the Enterprise Resources included sub-variables, such as, Financial Resources, Competent Human Resources, mainframe or personal computers, Application Software System, hardware systems and expert personnel. TAM optimises Enterprise Resources and it becomes increasingly complex, hence the nature of the product or service offering remains the driving force for the enterprise success.

Both tangible and intangible resources should be invested into, so that the adoption of EAA on SCM could be possible for enterprise success. Basic technology could include the use of internet, fax mail, social media and many more. By approaching the Department of Small Business Development, Department of Trade and Industry, Industrial Development Corporation, Land Bank and many more, SMEs could gain both mentorship and financial assistance for acquiring enterprise knowledge that would make it possible towards the adoption of EAA for SCM. The Theory of Reasoned Action (TRA) revealed that behavioural measures on Enterprise Resources that depends on speculations about the intensions towards the adoption of EAA for SCM.

5.2.3 Summary of Findings for Internal Factors: Information System Components

In this study, Information System Components included sub-variables such as transaction-support-system, Management Information System, Information System Components Governance, Decision Support System, Executive Support System, Knowledge Management Systems and internet and network connectivity. By incorporating Information System Components with right strategies SMEs could succeed in the adoption of EAA for SCM. All functional departments need to be linked directly to Information System Components so that there is an easy flow of data and information both internally and externally. Outsourcing the EAA activities will make it easier not to worry about domain; engagement model and governance; business architecture; and alignment. Architect specialist will focus on troubleshooting and updating the system. Compatibility in Diffusion Theory of Innovation ascertains that

Technology Acceptance Models need to be linked with relevant Information System Components to have a functional EAA for SCM.

5.2.4 Summary of Findings for Internal Factors: Employees' Competencies

Employees' Competencies in this study are seen as self-capabilities in using desktop computers to process SCM activities in a proficient manner (Tolstoshev, 20117). In this study, Employees' Competencies included a handful of sub-variables that were regarded as the ability to perform the following: using email and internet interfaces; creating and formulating word documents, tables and columns usage; spreadsheets utilisation and merging documents; employee communication skills; and creation of business networking for suppliers and customers that would assist in performing the SCM activities (Branscombe, 2018). By investing in Employees' Skills Development and Training, the SMEs would yield positive results as they will apply their knowledge and expertise to run a successful SCM activities. The Theory of Planned Behaviour (TPB) encourages apparent behaviour on control for supplementary forecaster on intentions of employees towards the adoption of EAA for SCM in SMEs

5.3 Summary of Findings on External Factors

External factors were regarded as outside world influences that the enterprise have limited control over and they affect the internal enterprise decision making on SCM activities (Hawks, 2019). In this study, the external factors included complex legal and regulatory constraints; lack of external financing; low technological capacity; relative advantage; compatibility of computer systems; customisability of EAA to the enterprise and external users; and information security that hampers the adoption of EAA for SCM. Legal and statutory requirements in Information Technology need to be acknowledged and practised to avoid any legal actions against the SMEs. Consultations with government parastatals or legal representatives of the enterprise would save the SMEs against any unforeseen challenges such as product liabilities, legal costs on lawsuit, tax evasion or avoidance penalties so forth.

5.4 Summary of Findings on Perceived Attitudes towards the Adoption of EAA

Perceived attitudes are regarded as the state of psychological readiness and enthusiasm to respond on certain aspect of enterprise challenges grounded on past

experience, exerting a directive or dynamic influence on the individual's reaction to all objects and situations to enhance the routine activities with excellent performance (Harry *et al*., 2007). In this study, perceived attitudes include four aspects, namely, Alternative User-Base Solutions; low Technological Aversion; vulnerability and stochasticity; and resistance to change. The entrepreneurial or managerial risk is linked to the attitudes of a firm's owner-manager or management and the challenge of mixing and confusing individual needs with organisational goals.

Proper procedure such as introduction, induction and orientation to the adoption of EAA for SCM would help the employees to have better background and the ability to confront any challenges as they arise. The Diffusion Theory of Innovation (TRA) proposes that the Perceived Attitudes towards the Adoption of EAA have is affected by behaviour challenges from employees' personal conduct that affect SCM activities within the SMEs.

5.5 Summary of Findings on Actual Adoption of EAA

Actual adoption was well-defined as an instrument and apparatus that focuses on the internal and external gaps faced by SMEs and by taking advantage of TAM such as EAA that would ease the SCM activities across all functional departments of specialisation that services as innovative practices for specific activities (Chen & Tsou, 2017). Summing up the results, it can be concluded that Actual Adoption of EAA was measured with three major objective of EAA, namely, improving the job performance, provision of critical support base and enhancing SCM activities. The Actual Adoption of EAA is based on tangible evidence but not ambitious evidence, as based on the assumption that most of SMEs owners are not enterprise architects meaning that they are regarded as the end-user with limited background on the fundamentals of EAA.

The Diffusion Theory of Innovation (TRA) emphasises that the lack of employees' level of expertise and support makes the adoption of EAA difficult project based on critical algorithms and extreme programming in SCM. The intention to use EAA was based on the establishment of receiving positive feedback and competitive advantage for SMEs to gain some expertise in computer programming for capturing data; transforming it into useful information; and sharing it internally and externally via e-

mails, saving and activating inbox messages (regarded as the alarm processor for notifications alert) with simplified processes (Kuehnhausen & Frost, 2011). For this study, the intention to use EAA, considered three scenarios such as; to ease SCM activities, to provide free-error mode in SCM and to ease SCM work-flow within the SMEs and to the external users without any sign of difficulties. The adoption of EAA was based on simplicity and easy work-flow that depends on thorough set-up for algorithms in SCM and links with the external user for easy access and interactions. SCM should be elaborated across all functional departments within and outside the enterprise so as to maximize the intention to have positive view and understanding revolving the adoption of EAA. The Diffusion Theory of Innovation (DTI) on the intention towards the adoption of EAA for SCM provides the competence in limiting some negative thoughts about the integrative phases or steps limiting the adoption of EAA for SCM.

5.6 Summary of Conclusions on Internal Factors

5.6.1 Summary of Conclusions for Internal Factors: Owners' Characteristics

In the context of this research, there appeared a need to understand the relationships between Owners' Characteristics and Perceived Attitudes towards the Adoption of EAA for SCM represents the respondents in the Capricorn Municipality where the sample was drawn. Statements like enterprise owners have "distinctive characters and drive" (Kuhn, Galloway & Collins-Williams, 2016) have been memorable in SCM activities in the economy and such information could have a positive effect on adoption of EAA. This research has revealed that the adoption of EAA impact the bottom line for SCM. Hence this research hypotheses was to cover the associations between Owners' Characteristics and the Actual Adoption of EAA for SCM in SMEs.

5.6.2 Summary of Conclusions for Internal Factors: Enterprise Resources

In the perspective of this research study, there was a need to master the relationships between Enterprise Resources and Perceived Attitudes towards the Adoption of EAA for SCM activities that were characterised by the respondents in the Capricorn Municipality as sample of the whole universe. Affirmations like "gross-functional activities leads to a sustainable economic success for SMEs" rely on tight cost structure" for a successful SCM within SMEs" (Mills *et al.,* 2013; Fotheringham &

Saunders, 2014; and Jenner, 2016) have been remarkable in SCM activities in the global context that it could make the provision of positive shift towards the adoption of EAA for SCM. There has been revelation that the adoption of EAA in SCM provide optimistic results by adopting EAA in SMEs. Therefore, the research hypothesis was to make the reassurance on the associations between current acceptances of EAA linked to Enterprise Resources.

5.6.3 Summary of Conclusions for Internal Factors: Information System Components

The findings of the research are quite convincing, and thus the following conclusion can be drawn, namely: it is important to assure the relationships amongst Information System Components and Perceived Attitudes towards the Adoption of EAA for SCM actions that were well-known by a number of respondents in the Capricorn Municipality known as the research sample. Statements like “Information System Components embraces a combined set of components for collecting data, packing data and converting data in the form of practical structure known as information that could be applied for indulging in rational-decisions making” (Zwass, 2018), have remained remarkable in SCM activities in the international economy that it could accomplish optimistic results on the adoption of EAA for SCM. It was discovered that the adoption of EAA has a positive impact on the core activities for SCM in SMEs. Therefore, the research hypothesis was to provide the assurance on the associations between current acceptance of EAA, SCM and SMEs.

5.6.4 Summary of Conclusions for Internal Factors: Employees’ Competencies

From the outcomes of our investigation it is possible to conclude that it was necessary to reassure the relationships amongst Employees’ Competencies and Perceived Attitudes towards the Adoption of EAA for SCM engagements that were acknowledged by a number of respondents in the Capricorn Municipality known as the symbolic sample from the research population. Statements such as “Employees’ Competencies cover a number of psychometric mechanisms, such as self-assessments and 360-degree assessments of their routine role and work status quo” (Metcalf, 2015; and Rees & Porter, 2015), have produced outstanding messages in SCM activities in global economy that it could attain confident results on the adoption of EAA for SCM. It was discovered that the adoption of EAA has a positive impact on the core activities

for SCM in SMEs. As a result, the research hypothesis was to provide the assurance on the associations that the adoption of EAA for SCM and SMEs is based on the Employees' Competencies and cost-benefit analysis. It was revealed that for SCM to be effective and efficient the adoption of EAA has to be in place to eliminate traditional procedures as a linkage between the SMEs and its external counterparts.

5.7 Summary of Conclusions on External Factors

From the outcomes of the investigation, it is possible to conclude that it was necessary to reassure the relationships amongst external factors and Perceived Attitudes towards the Adoption of EAA for SCM activities that were accepted by a number of respondents in the Capricorn Municipality, referred to as the representational sample from the research population. Declarations were confirmed such as "external environment has a substantial effect on SMEs and its role playing as decision towards the adoption of EAA for SCM in SMEs and the justifications on its expenditures and predictable benefits might be linked with future proceeds on investments" (Trinh-Phuong *et al.,* 2012; and Epe; 2015).

It was learned that the adoption of EAA has a constructive control on the core events for SCM in SMEs. Nonetheless, the research hypothesis was for the SMEs to be accountable for any change from external environment as they have direct impact on the entity and relations between current acceptance of EAA, SCM and SMEs. It was brought to attention that for the SCM to be productive, the adoption of EAA has to be prioritised to provide assurance against any change that could hamper SMEs' activities.

5.8 Summary of Conclusions on Perceived Attitudes towards the Adoption of EAA

Based on the results, it can be concluded that it was essential to reassure the relationships among Perceived Attitudes towards the Adoption of EAA and the intention to use EAA for SCM activities that existed in the recognition by most of the respondents in the Capricorn Municipality. Affirmations were made, such as "the industrial revolution has modernised the livelihood of most SMEs, despite the setbacks during the process of adopting TAM such as EAA for SCM" (Anderson & Perrin, 2017).

It is knowledgeable that the constructive control measures need to be taken into account to produce free-error operational system is SCM. Nonetheless, the research hypothesis was for the SMEs to be accountable for any change from Perceived Attitudes towards the Adoption of EAA as it has a significant impact to the SMEs for SCM activities. It is therefore, acknowledged that significant focus should be dedicated to Perceived Attitudes towards the Adoption of EAA.

5.9 Summary of Conclusions on Actual Adoption of EAA

In this research review, the remarks typically highlighted the Actual Adoption of EAA as a core dependent variable used at a last stage of which other independent variables were indirectly linked with it. The relations between the Actual Adoption of EAA and the indirect variables was also made possible with the SCM actions, such as, improvement on-the-job performance, providing Critical Support-Base and enhancing SCM activities. That also appeared in the recognition by a number of respondents in the Capricorn Municipality that indirectedly, as the research sample, represented an extensive percentage arising from the research population. Affirmations came up, such as “SMEs using the current systems could make upgrades instead eradicating the current system for SCM” (Harry *et al.,* 2017). It is imperative to be acknowledged that newly upgraded EAA has the greatest potential in advancing the SCM in SMEs.

5.10 Recommendations

In this section, the research recommendations are organised per hypothesis and sub-hypothesis. The research study had a conceptual model that was regarded as an approach in the Actual Adoption of EAA. Based on this framework and the review of TAM, SCM and EAA, three gaps are identified and discussed concisely in this chapter.

5.10.1 Recommendations on Internal Factors

5.10.1.1Summary of Recommendations for Internal Factors: Owners’ Characteristics

The internal factors on Owners’ Characteristics should be considered as a technological aspect for the adoption of EAA. A coordinated program facilitation should serve as a key priority in developing Owners’ Characteristics that would stimulate; passion, creative thinking and mind-set in risk taking, discipline for action orientation, innovation abilities for hard-working, vision oriented and owner’s resilience towards

the their Perceived Attitudes towards the Adoption of EAA.A well-coordinated program for Owners' Characteristics should be supported with online distance learning and small business training that would cover accounting and finance; business operations and management; business plan; finance; corporate governance; legal factors, and integrated marketing communication. They could attain assistance in improving their personal characteristics through education for both entrepreneurs and business owners.

5.10.1.2 Recommendations for Internal Factors: Information System Components

The internal aspects on Information System Components should be focused on as a critical basis for enhancing Information System Components so that effective and efficient EAA would produce remarkable results for SCM in SMEs. A synchronised EAA should at first establish five critical requirements, namely: organisational architecture, business architecture, application architecture, information architecture and technological architecture. Subsequently, the Information System Components such as transaction-support-system, management-information-system, Information System Components Governance, Decision Support System, Executive Support System, Knowledge Management Systems, internet and network connectivity, need to be aligned with EAA infrastructure for a successful SCM.

5.10.1.3 Recommendations for Internal Factors: Enterprise Resources

The internal challenges on Enterprise Resources should be prioritised in terms of replacing the old ones or maintain them and even considering repairs in order to facilitate a progressive EAA for SCM within the SMEs. Appropriate resources linked with correct EAA systems could make functional activities more accessible and easy to formulate strategies so as to simplify SCM activities. Efficient and effective information flow could grant the assurance for custom-built product and design with greater levels of satisfaction (Shamsuzzoha & Helo, 2012). The SMEs should be in good position to integrate resources for gaining competitive advantage in the market with the adoption of EAA (Toor, 2016). The SMEs need to be in possession of Financial Resources, Competent Human Resources, mainframe or personal computers, Application Software System, hardware systems and expert personnel so that the adoption of EAA would not be dream but a reality.

5.10.1.4 Recommendations for Internal Factors: Employees' Competencies

The in-house forces on Employees' Competencies should be dealt without any sign of reluctance as they are regarded as the core source of inputs to the enterprise so that there will be effective and productive EAA for SCM. A well co-ordinated SME should at least develop its employees with skills, such as using internet interfaces, spreadsheets utilisation and merging documents, creating business networking, enterprise integration and administration and so forth. However, more research on this aspect needs to be undertaken with the association between the Adoption of EAA and Employees' Competencies.

5.10.2 Recommendations on External Factors

There is a global trend towards the adoption of EAA. SMEs in a number of industries are making research with regard to the evaluation and implementing the EAA strategies and study programs that could build long-term relationships between external factors and perceived attitudes, leading to the acceptance or rejection of EAA. The external factors on Information System Components should be concentrated on as an important foundation for improving the adoption of EAA for SCM in SMEs. A coordinated EAA should at least have strong capabilities against any external threats such as spyware, cyber-crime, hacking and so forth. On the other hand, the external factors included complex legal and regulatory constraints; external financing; low technological capacity; relative advantage; systems compatibility; and systems customisability that need to be considered when processing the EAA for SCM.

5.10.3 Recommendations on Perceived Attitudes towards the Adoption of EAA

This research objective has explored the relationship between Perceived Attitudes towards the Adoption of EAA and the intention to use EAA for SCM in SMEs. SME owners and employees are recommended to confront fear that perpetuates their Perceived Attitudes on the Adoption of EAA for SCM. By eliminating and confronting few aspects on perceived attitudes, that included; considering Alternative User-Base Solutions that are ready to use just in a click of a button, minimising risks on low Technological Aversion, detecting any chances of vulnerability and stochasticity and lastly pushing away the fear and panic towards the resistance to change. Therefore,

both SME owners and employees need to access the contributing factors that would yield positive attitudes towards the adoption of EAA for SCM.

5.10.4 Recommendations on Actual Adoption of EAA

The internal traits on the Actual Adoption of EAA should be dedicated towards the positive outcomes within the SMEs for SCM. A well-cooperated EAA should be considered for rejuvenating the users' level of interest. Although TAM originates with more complicated upgrades, it is important to enhance employee competency; updating both software and hardware systems; magnifying the security level against cybercrime; and many of unforeseen circumstances. The in-house characters on the intention to use EAA should be directed towards the optimistic results on the adoption of EAA for SCM in SMEs. A sound collaborated EAA should be well thought-out for renewing the users' level of importance.

Although TAM comes with sophistication in user capabilities, it is advisable to consider basic processes like transmitting information; discovering new methods of using email; collaboration or linking other users; speed and convenience; integration of key business processes from electronic data interchange; browser updates; computability between the computer hardware and software systems; network configuration; flexible access; and transmission media, all need to be taken into account that factors that would bring positive light into the adoption of EAA for SCM, such as, EAA would ease SCM activities, pursuit of free-error mode and ease SCM work-flow by establishing critical requirements, such as, simplified processes; auto-response; ease of access; collaboration; integrated media; multiple creators of content; interactivity; and browser updates, need to be fully practised to have a competitive advantage evident in maximum productive scale in SCM.

Actual Adoption of EAA will be possible only if the primary motive is to improve job performance, provide Critical Support-Base and enhance SCM activities. Consultation with architect expect will save the SMEs cash by gaining competitive advantage on the SCM activities linked to EAA. To test the model using SMEs that are considering the adoption of EAA to determine if training plays a more or less significant role in the pre-adoption phase of diffusion (Harrison *et al.*, 2013; Hazen *et al.*, 2014;

and Itamir & Gibeon, 2015). Murthy and Mani (2013) have identified factors that that discern technology rejection upon the following aspects:

5.10.4.1 Technical Complexity

SMEs with capabilities for defining technological complexity have save themselves against confusion and stress of exchanging data with wrong users, from both internal and external business environments (Ruhl *&* Katz*,* 2015*;* and Vaesen & Houkes, 2017). The failure to achieve the correct EAA model would increase the confusion (Leydesdorff, 2000). Economic and technological complexities playa meaningful role in transforming the SMEs growth (Cohen, 2018). The complexity of the networks of SMEs should be related to the economic growth (Rycroft & Kash, 1999). There should be strict consequences for unethical actions of information theft and manipulation (Paulo, 2014; and Arbesman, 2015). There is therefore a definite need to take into account the technical complexity that affects the adoption of EAA within the SMEs for SCM.

5.10.4.2 Technological Failure

Technological failure is destruction on the system that includes power failure, incompatibility to calibrate with internal and external electronic sources, dysfunctionality of the computer systems and a failure to produce desired results (Dasgupta & Kadjo, 2013; Ronny, 2017; and Regalado, 2018). Technological failures could be linked directly with the SMEs' averseness to hardware and software upgrades (Chen, 2017; Cooke, 2018; and Bilbro, 2018). Some large corporations and banks were facing the leaking of confidential sales information, which is a true reflection of technological failure or non-adoption of effective EAA that includes protection against system hacking (Gerstein, 2012; and Grothaus, 2018). An automatic backup system is recommended to SMEs as a measure against unforeseen circumstances such as theft and damage from natural disasters (Hamrouni, 2017). The use of cameras in securing the SMEs and password authentications are absolute measures for securing authorised-user activities (Regalado, 2018). An implication of these findings is that both EAA and technological failure need measures to achieve efficient SCM.

5.10.4.3 Technological Intransigence

Technological intransigence is regarded as the inability of the software and hardware system to perform to expected commands at a given time throughout the SCM operations (Vogt, 2015). Technological intransigence is dependent on flexibility within the SMEs and its external stakeholders because of lack of compatibility among different software application systems (Han, Wang & Naim, 2018; and Goldenberg & Dyson, 2018). A flexible architecture model that is based on efficiency and effectiveness will be required for a successful EAA adoption (Bawa, Buchholz, de Villiers, Corless, & Kaliner, 2017; and Sanders, Zeng, Hellicar & Fagg, 2016). Flexibility in the Supply Chain can be used to strengthen the business relationships between different suppliers, distributors, wholesalers and retails stores (Pereira, Sellitto, & Borchardt, 2018; and Han, Wang & Naim, 2018).

5.11 Conclusion on Recommendations Made

Software programmes, such as Info CloudSuite Industrial (SyteLine), ERP Software, Business Management Software, SAP Business By Design and Dynamics, 365 Business Central and many more, should be synchronised in EAA as the starting point for both enterprise owners and managers. Information System Components, Enterprise Resources and Employees' Competencies that includes knowledge on external factors, such as, spyware, cyber-crime and hacking should be improved. Common threats on Perceived Attitudes towards the Adoption of EAA, such as, Alternative User-Base Solutions, low Technological Aversion and vulnerability. Resistance to change should be considered to have a successful adoption of EAA for SCM in SMEs.

ANNEXURES

Annexure A: CPASA for Master's and Doctoral Students

Memorandum of Understanding Between

Professor GPJ PELSER in the Department of BMAN who holds the following academic qualification (highest): DBL

And

Candidate: Kingston Xerxes Theophilus Lamola: Student Number:

DECLARATION BY CANDIDATE

I have been presented with the following:

- "Record of your research and research Progress" with all relevant documents.
- Code of practice on the admission, supervision and examination of research students
- Policy and Procedures on Postgraduate Research and Supervision.
- Code of Conduct for Research.
- Promoting Research Integrity and the Responsible Conduct of Research – A checklist
- The University Calendar, the School Calendar, and the following other policies and procedures documents (list these):

I have read and understood the rules, regulations, codes and policies of the University and have discussed the general requirements of my research work, the work plan and the recommended courses and induction programmes with my supervisor. I understood and agreed to my obligations and responsibilities. I have read and understood the health and safety procedures of the University and have been advised of any particular hazards and precautions associated with my research work. I indemnify the University of all responsibility should anything happen to me, due to my own negligence, in the course of my research work. I agree that the University reserves the right to terminate my registration at any time should my conduct and progress not be satisfactory.

DECLARATION BY SUPERVISOR

I/We have met with the above named candidate, discussed with him/her the requirements and all relevant rules, regulations, procedures, codes and policies of the University and the roles and responsibilities of the supervisor. I agree to carry-out my supervisory duties and responsibilities and will endeavour to keep a healthy, cordial and academic relationship with the student to ensure that s/he completes in the prescribed minimum time for the degree without compromising academic standards.

Duly signed:

……..... …….…….. ……..

(Supervisor) (Place) (Date)

……..…….. ……..…….. ……

(Candidate) (Place) (Date)

Counter signed (HoD)……

(Director of the School)…….…… (Dean)…….....

Annexure B: Letter of Consent

Lamola Kingston Xerxes Theophilus
University of Limpopo
Private Bag X 1106
SOVENGA
0727
25th July 2019

Dear Respondent

I would like to introduce myself as Lamola Kingston Xerxes Theophilus, a Post-Graduate Student at the University of Limpopo for academic year 2019. I am conducting data collection as a partial fulfilment for Masters of Commerce in Business Management, in the Faculty of Management and Law, under the School of Economics and Management in the Department of Business Management. The aim for this study is to investigate factors influencing the adoption of Enterprise Application Architecture for Supply Chain Management in Small and Medium Enterprises within the Capricorn District Municipality.

The questionnaire comprises of fifty-five questions. It will take you approximately twenty minutes to complete it. The Likert scale "tick the box" questions is used. Should you have any difficulty in completing the questionnaire, please do not hesitate to contact the researcher @ kxtlamola@rocketmail.com orKingston.lamola@ul.ac.za or (015) 268 2538\2638 or (082) 361 0285.

Thank you very much in advance for your genuine participation.

Kindest Regards: Lamola KXT

SIGNATURE	
DATE	25th July 2020

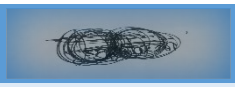
Annexure C: Questionnaire

Dear Respondent or Participant…

Before responding to any question, please note the following important information;

a) Your participation is voluntary.
b) You are not feeling pressured to participate.
c) You can withdraw from the survey at any time.
d) Your personal and contact details are not needed.
e) Your confidentiality and privacy will be maintained.
f) You have the rights to refuse to partake in the survey.
g) The survey offers guarantee anonymity or confidentiality for your participation.

I, declare that, I read the above guidelines and understood them before responding to the questionnaire.

SIGNATURE	
DATE	25th July 2019

SECTION A: INTERNAL FACTORS

1) OWNERS' CHARACTERISTICS

Please indicate your agreement with the following statements about the Owners' Characteristics.

Sigma Notations	Please tick an appropriate box (✓) from 1.1 to 1.6.	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
1.1)	Demonstrate passion for being successful with the business.	(1)	(2)	(3)	(4)	(5)
1.2)	Try out new ideas in the business.	(1)	(2)	(3)	(4)	(5)
1.3)	Set goals and guidelines to achieve them.	(1)	(2)	(3)	(4)	(5)
1.4)	Demonstrate passion for hard-work.	(1)	(2)	(3)	(4)	(5)
1.5)	Ignore distractions and focus on the immediate challenges.	(1)	(2)	(3)	(4)	(5)
1.6)	Demonstrate "fight back" when problems threaten.	(1)	(2)	(3)	(4)	(5)

2) ENTERPRISE RESOURCES

Please indicate your agreement with the following statements about the Enterprise Resources for new information systems such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓) from 2.1 to 2.6.	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
2.1)	The enterprise has sufficient Financial Resources to adopt new technologies.	(1)	(2)	(3)	(4)	(5)
2.2)	The enterprise has enough human resources to adopt new technologies.	(1)	(2)	(3)	(4)	(5)
2.3)	The enterprise has mainframe computers to adopt new technologies.	(1)	(2)	(3)	(4)	(5)
2.4)	The enterprise has personal computers to adopt new technologies.	(1)	(2)	(3)	(4)	(5)
2.5)	The enterprise has computer hardware to share information accordingly.	(1)	(2)	(3)	(4)	(5)
2.6)	The enterprise has expert back-up plan on new technologies.	(1)	(2)	(3)	(4)	(5)

3) INFORMATION SYSTEM COMPONENTS

Please indicate your agreement with the following statements about the Information System Components of your enterprise for new information systems such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓) from 3.1 to 3.6.	N0t at all (1)	No (2)	Moderate level (3)	Yes (4)	Definitely (5)
3.1)	Does the enterprise have a way of making payment on-line?	(1)	(2)	(3)	(4)	(5)
3.2)	Does the enterprise have way of managing information on-line?	(1)	(2)	(3)	(4)	(5)
3.3)	Does the enterprise have information controlling measures?	(1)	(2)	(3)	(4)	(5)
3.4)	Does the enterprise have a system that support their decisions?	(1)	(2)	(3)	(4)	(5)
3.5)	Does the enterprise have the system that support the owner's duties?	(1)	(2)	(3)	(4)	(5)
3.6)	Does the owner of the enterprise have knowledge about information systems?	(1)	(2)	(3)	(4)	(5)
3.7)	Does the enterprise use internet and network connectivity?	(1)	(2)	(3)	(4)	(5)

4) EMPLOYEES' COMPETENCIES

Do the employees and managers possess the following competencies for new information systems such as Enterprise Application Architecture* (See bottom page)?

Sigma Notations	Please tick an appropriate box (✓), from 4.1 to 4.10.	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
4.1)	Do the employee have the skills for using the internet?	(1)	(2)	(3)	(4)	(5)
4.2)	Do the employees have the ability for creating and formulating word documents?	(1)	(2)	(3)	(4)	(5)
4.3)	Do the employees have the ability to use tables and columns?	(1)	(2)	(3)	(4)	(5)
4.4)	Do the employee have the ability for using spreadsheets and merging documents?	(1)	(2)	(3)	(4)	(5)
4.5)	Do the employees have communication skills for dealing with customers?	(1)	(2)	(3)	(4)	(5)
4.6)	Do the employees have network channel with suppliers and customers?	(1)	(2)	(3)	(4)	(5)
4.7)	Does the enterprise control its website information?	(1)	(2)	(3)	(4)	(5)
4.8.)	Does the enterprise manage its administration files on-line?	(1)	(2)	(3)	(4)	(5)
4.9)	Does the enterprise manage its information resources?	(1)	(2)	(3)	(4)	(5)
4.10)	Does the enterprise manage its resources as planned?	(1)	(2)	(3)	(4)	(5)

SECTION B: EXTERNAL FACTORS

5) Please indicate your agreement with the following statements on the external factors on new information systems such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓) from 5.1 to 5.7	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
5.1)	Legal constraints hinder the use of new hardware and software in my business.	(1)	(2)	(3)	(4)	(5)
5.2	Lack of external financing impact the adoption of Information Technology.	(1)	(2)	(3)	(4)	(5)
5.3)	Low technological accessibility impact the adoption of Information Technology.	(1)	(2)	(3)	(4)	(5)
5.4)	Information Technology lead to unfair advantage within the market.	(1)	(2)	(3)	(4)	(5)
5.5)	Difficult requirements in technological environment affect the adoption of Information Technology.	(1)	(2)	(3)	(4)	(5)
5.6)	Tolerant with external computers affect business activities.	(1)	(2)	(3)	(4)	(5)
5.7)	Information Technology expose the enterprise to information theft.	(1)	(2)	(3)	(4)	(5)

SECTION C: PERCEIVED ATTITUDES TOWARDS THE ADOPTION OF ENTERPRISE APPLICATION ARCHITECTURE

6) Please indicate your agreement with the following statements for perceived attitudes towards the use of new Information Technology such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓), from 6.1 to 6.4.	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
6.1)	I sometime use old work procedures to process my daily activities.	(1)	(2)	(3)	(4)	(5)
6.2)	I dislike technological processes.	(1)	(2)	(3)	(4)	(5)
6.3)	My work is not secured when I use Information Technology.	(1)	(2)	(3)	(4)	(5)
6.4)	I only use technology under supervision.	(1)	(2)	(3)	(4)	(5)

SECTION D: INTENTION TO USE ENTERPRISE APPLICATION ARCHITECTURE

7) Please indicate your agreement with the following statements on the intention to use new information systems such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓), from 7.1 to 7.3.	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
7.1)	Information Technology simplify my day-to-day activities.	(1)	(2)	(3)	(4)	(5)
7.2)	Information Technology highlight technical errors for me.	(1)	(2)	(3)	(4)	(5)
7.3)	It makes work flow straightforward.	(1)	(2)	(3)	(4)	(5)

SECTION E: ACTUAL ADOPTION OF ENTERPRISE APPLICATION ARCHITECTURE

8) Please indicate your agreement with the following statements for actual adoption of information systems such as Enterprise Application Architecture* (See bottom page).

Sigma Notations	Please tick an appropriate box (✓), from 9.1 to 9.3	Strongly Disagree (1)	Disagree (2)	Moderate (3)	Agree (4)	Strongly Agree (5)
8.1)	Information Technology improves my job satisfaction.	(1)	(2)	(3)	(4)	(5)
8.2)	Information Technology support all aspect of my job requirement.	(1)	(2)	(3)	(4)	(5)
8.3)	Information Technology allows me to accomplish more work than in manual process.	(1)	(2)	(3)	(4)	(5)

……Thank you very much for your participation…..

Annexure D: Turfloop Research Ethics Committee-Ethics Clearance Certificate

University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE

ETHICS CLEARANCE CERTIFICATE

MEETING:	06 March 2019
PROJECT NUMBER:	TREC/23/2019: PG
PROJECT:	
Title:	Factors influencing the adoption of Enterprise Application Architecture for Supply Chain Management in Small and Medium Enterprises within Capricorn District Municipality.
Researcher:	KXT Lamola
Supervisor:	Prof GPJ Pelser
Co-Supervisor/s:	Prof O Fatoki
School:	Economics and Management
Degree:	Master of Commerce in Business Management

PP. Ajmba
PROF P MASOKO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:
i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Finding solutions for Africa

REFERENCES

Abbott, P., Goosen, X. & Coetzee, J. 2013. *The Human Resource Function Contribution to Human Development in South Africa.* Vol. 11 Issue 1. From: https://sajhrm.co.za/index.php/sajhrm/article/view/408/680 (Accessed 20 May 2018).

Abraham, R., Burnett, M.M. & Erwig, M. 2008. *Spreadsheet Programming. Semantic scholar*. From: https://www.semanticscholar.org/paper/Spreadsheet-Programming-Abraham-Burnett/e2b52b331a87762ae7f3e0cfeff8a7669281891b (accessed 16 June 2019).

Accenture. 2012*. Biometrics and Privacy: A positive match. How organisations can use biometrics technologies and protect individuals' privacy in the journey to high performance*. From: https://www.google.co.za/search?q=Biometrics+and+privacy:+A+positive+match.+How+Organisations+can+use+biometrics+technologies+and+protect+individuals%E2%80%99+privacy+in+the+journey+to+high+performance.&ei=VzFHXM_aOoOE1fAP2YCq0Ac&start=10&sa=N&ved=0ahUKEwiP4rGF1YHgAhUDQhUIHVmACnoQ8tMDCIQB&biw=1455&bih=667 (accessed 22 January 2019).

Administrative Divisions of South Africa. 2018. *List of Municipalities in Limpopo*. From: https://en.wikipedia.org/wiki/List_of_municipalities_in_Limpopo (accessed 15 Nov 2018).

Amine, S. 2018. *Employment Protection Legislation in Emerging Economies*. IGI Global. From: https://books.google.co.za/books?hl=en&lr=&id=rvBJDwAAQBAJ&oi=fnd&pg=PR1&dq=Employment+Protection+Legislation+in+Emerging+Economies.+IGI+Global&ots=rsdGiZCFva&sig=_bMdnlsjpW--3oPwwaxKq02jXus#v=onepage&q=Employment%20Protection%20Legislation%20in%20Emerging%20Economies.%20IGI%20Global&f=false (accessed 16 September 2019).

Agrasuta. V. 2013. *The Adoption of Green Dentistry among Dentists in Thailand*. From:https://www.researchgate.net/publication/281629128_The_Adoption_ofGreen_Dentistry_among_Dentists_in_Thailand (accessed 07 February 2019).

Ahmad, N. & Mehmood, R 2015. Enterprise Systems: Are we ready for future sustainable cities, *Supply Chain Management: An International Journal* 20(3):264-283.

Ajzen, I. 1991. *The Theory of Planned Behavior: Organisational behavior and human decision processes* 50(2):179-211 (accessed: 4 June 2018).

Alshamari, M. 2016. *Usability Factors Assessment in Health Information System*. From: https://www.scirp.org/journal/PaperInformation.aspx?PaperID=72201 (accessed 19 February 2019).

Alsemgeest, L., du Toit, E., Ngwenya, S. & Thomas, K. 2014. Corporate Finance: A South African Perspective. Southern Africa: Oxford University Press.

Altexsoft. 2018. *Legacy System Modernization: How to transform the enterprise for digital future*. From: https://www.altexsoft.com/whitepapers/legacy-system-modernization-how-to-transform-the-enterprise-for-digital-future/ (accessed 19 December 2018).

Althuser, J. 2018. *Funding. From: https://www.entrepreneurmag.co.za/advice/starting-a-business/start-up-advice/6-resources-for-start-ups-looking-for-funding/* (accessed: 15 May 2018).

Alziari, L. 2017. A Chief HR Officer's Perspective on Talent Management. *Journal of Enterprise Effectiveness: People and Performance*, Vol. 4 (4):379-383.

Anayet, F.M.A. & Ali, K. 2014. *Relation between Individual and Society*. From:http://file.scirp.org/Html/8-1760197_49227.htm (accessed 28 January 2019).

Anderson, A. 2010. *Case Study: The motivation for biometrics: convenience, as well as security, are key factors*. From: https://www.healthcareinfosecurity.com/case-study-motivation-for-biometrics-a-2686 (accessed 2 December 2018).

Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D. & Martin, K. 2013. *Quantitative Methods for Business,* 12th edition. Canada: South-Western Cengage Learning.

Anderson, M. & Perrin, A. 2017. *Barriers to Adoption and Attitudes towards Technology.*From:http://www.pewinternet.org/2017/05/17/barriers-to-adoption-and-attitudes-towards-technology/ (accessed 26 February 2019).

Anesthesiol, K.J. 2017. *Introduction of a Pilot Study*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5716817/ (accessed: 19 November 2018).

Ansara, D., Endres, R. & Mothibatsela, B. 2019. *OPINION: Open for business? How SMMEs in South Africa can thrive*. From: wwwnews24.com/fin24/opinion/opinion-how-smmes-in-south-africa-can-thrive-20191118 (accessed 04 July 2020).

Ann, P.J. 2019. *Poor Technological Capability Undermining Africa's Growth Potential*. From: https://www.afdb.org/en/news-and-events/poor-technological-capability-undermining-africas-growth-potential-13684/ (accessed 15 February 2019).

Appelbaum, S.H., Kryvenko, O., Parada, M.R., Soochan, R.M. & Shapiro, B.T. 2015. Racial-Ethnic Diversity in Canada: Competitive edge or corporate encumbrance? Part one. *Journal of Industrial and Commercial Training* 47(6): 302 – 309. From: https://www.emerald.com/insight/content/doi/10.1108/ICT-03-2014-0012/full/html (accessed 11 June 2019).

Arbesman, S. 2015. *The Problem with Technological Ignorance: And why we need to teach abstraction*. From: http://www.slate.com/articles/technology/future_tense/2015/12/the_problem_with_technological_ignorance.html (accessed 4 August 2018).

Ardley, B., Moss, P. & Taylor, N. 2016. Strategies Snarks and Stories: SMES owner manager perceptions of business advisers. *Journal of Research in Marketing and Entrepreneurship* 18(2):211-231. From: https://www.researchgate.net/publication/311477845_Strategies_Snarks_and_stories_SME_owner_manager_perceptions_of_business_advisers (accesed 12 May 2020).

Arisar, J. 2016. *A Communication Model*. From: http://datacombasic.blogspot.com/2011/03/communication-model.html (accessed: 5 August 2018).

Asetpartners. 2018. *Enterprise Application Architecture.* From: http://asetpartners.com/enterprise-architecture.php (accessed 28 October 2018).

Asif, Q.G. Braytee, A. & Hussain, F.K. 2017. Adaptive Service e-Contract Information Management Reference Architecture: VINE. *Journal of Information and Knowledge Management Systems* 47(3):395-410.

Asmundson, I. 2017. *Supply and Demand: Why markets tick.* From: http://www.imf.org/external/pubs/ft/fandd/basics/suppdem.htm(accessed: 14 May 2018).

Atlassian. 2018. Tables. From: https://confluence.atlassian.com/doc/tables-136463.html (accessed 26 December 2018).

Ayer, B. 2010. *Mainframe to Desktop: Why was the PC born?* From: http://history.msu.edu/hst250-hybrid/2010/01/27/mainframe-to-desktop-why-was-the-pc-born/ (accessed 20 May 2018).

Banaeianjahromi, N. & Smolander, K. 2016. What Do We Know about the Role of Enterprise Architecture in Enterprise Integration? A systematic mapping study. *Journal of enterprise information* management 29(1):140-164.

Azad, M.A.K. 2018. *What are the Merits and Demerits of Multi-Stage Random Sampling?* From:http://www.preservearticles.com/201107189307/what-are-the-merits-and-demerits-of-multi-stage-random-sampling.html (accessed 14 November 2018).

Azoulay, A., Jones, B., Kim, J.D. & Miranda, J. 2018. *Age and High-Growth Entrepreneurship.* From:http://www.nber.org/papers/w24489 (accessed 17 August 2018).

Bawa, R., Buchholz, S., de Villiers, J. Corless, K. & Kaliner, E. 2017. *Inevitable Architecture: Complexity gives way to simplicity and flexibility.* From: https://www2.deloitte.com/insights/us/en/focus/tech-trends/2017/simplifying-it-systems-architecture.html (accessed 4 August 2018).

Badenhorst-Weiss, H., Strydom, S., Strydom, J., Heckroodt, S., Howell, J., Cook, G. & Phume, T.B. 2016a. *Supply Chain Management: A South African Approach.* Cape Town: Oxford University Press.

Badenhorst-Weiss, J.A., van Biljon, E.H.B. & Ambe, I.M, 2018b. *Supply Chain Management: A Balance Approach,* 2nd edition, South Africa: Pretoria.

Beal, V. 2018. MIS-Management Information System. From: https://www.webopedia.com/TERM/M/MIS.html (accessed 24 May 2018b).

Baker, R., Brick, J.M., Bates, N.A., Battaglia, M., Couper, M.P., Dever, J.A., Gile, K.J. & Tourangeau R. Summary Report of the AAPOR Task Force on Non-probability Sampling. From: https://academic.oup.com/jssam/article-abstract/1/2/90/941418 (accessed 18 January 2021).

Benade, S.J. & Pretorius, L. 2012.*System Architecture and Enterprise Architecture: A juxtaposition?*
From:http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2224-7890201200 0200005(accessed 24 July 2018).

Bennett, M. 2017. *Why External Partners are Essential for Innovation and Efficiency.* From: https://www.telegraph.co.uk/business/ready-and-enabled/collabora ting-with-external-partners/ (accessed: 12 May 2018).

Bilbro, J. 2018. *Technological Failures, New Localism and More*. From: https://www.frontporchrepublic.com/2018/02/water-dipper/ (accessed 4 August 2018).

Brandeisky, K. 2015. *5 Things You Didn't Know about Using Personal email at Work.* From:http://time.com/money/3729939/work-personal-email-hillary-clinton-byod/ (accessed: 10 May 2018).

Blackburn, R.A., Hart, M. & Wainwright, T. 2013.Small Business Performance: Business, Strategy and Owner-Manager Characteristics*, Journal of Small Business and Enterprise Development* (20)1:8-27. From https://doi.org/10.1108/14626001311298394 (accessed 06 July 2020).

Branscombe, M. 2018. *You've Been Using Excel Wrong All Along (and that's OK).* From: https://www.zdnet.com/article/youve-been-using-excel-wrong-all-along-and-thats-ok/ (accessed 16 June 2018).

Bridges, D. 2012. *5 Tips on Using BCC in Outlook Email.* From: https://www.microsoft.com/en-us/microsoft-365/blog/2012/03/23/5-tips-on-using-bcc-in-outlook-email/ (accessed 10 May 2018).

Brunello, A. 2013. The Relationship between Integrated Marketing Communication and Brand Equity*. International Journal of Communication Research* 3(1):9-12.

Bugg, L. 2018. *5 Tech Failures That Can Turn Your Life into a Horror Movie.* From: http://www.cracked.com/blog/5-tech-failures-that-can-turn-your-life-into-horror-movie/ (accessed 4 August 2018).

Burson, J. 2015. *Standardization and the Open Web*. From: https://alistapart.com/article/standardization-and-the-open-web (accessed 5 June 2018).

Cadarette, M.S., Ban, K.J., [a]Giulia, J.K., Consiglio, P.G., Black, C.D., Dubins, D., Marin, A. & Tadrous, M. 2017. *Diffusion of Innovations Model Helps Interpret the Comparative Uptake of Two Methodological Innovations: Co-Authorship network analysis and recommendations for the integration of novel methods in practice*. From: https://www.sciencedirect.com/science/article/pii/S0895435616308356 (accessed 02 April 2019).

Callaghan, C.W. 2013. Individual Values and Economic Performance of Inner-City Street Traders. *Journal of Economics* 4(2):145-156.

Callen, T. 2020. Gross Domestic Product: An Economy's all. *Finance and development*. From: https://imf.org/external/pubs/ft/fandd/basics/gdp.htm (accessed 09 July 2020).

Camadan, F., Reisoglu, I., Ursavas, Ö.F. & Mcilroy, D. 2018. How Teachers' Personality Effect on Their Behavioral Intention to Use Tablet PC. *The International Journal of Information and Learning Technology*, 35(1):12-28.

Catley, S. & Hamilton, R.T. 1998. Small Business Development and Gender of Owner. *Journal of Management Development* (17)1:75-82. From:https://doi.org/10.1108/02621719810368718 (21 July 2020).

Chatterjee, N. & Das, H. 2016. A Study on the Impact of Key Entrepreneurial Skills on Business Success of Indian Micro-Entrepreneurs: A case of Jharkhand Region, http://journals.sagepub.com/doi/full/10.1177/0972150915610729(accessed 20 August 2018).

Chen, B. 2017. *The Biggest Tech Failures and Successes of 2017.* From: https://www.wral.com/the-biggest-tech-failures-and-successes-of-2017/17183921/ (accessed 4 August 2018).

Campbell, M. 2018. *Postmodernism and Educational Research: Scientific research.* From: https://file.scirp.org/Html/6-1761969_86024.htm(accessed 14 Sept 2019).

Capricorn District Municipality. 2017. *Final IDP/Budget,* 2017. From: http://www.cdm.org.za/attachments/article/344/APPROVED%20IDP%202016-2021.pdf (accessed 2 May 2018).

Carroll, J.S., Goodman, P.S., Ramanujam, R., Edmondson, A.C., Hofmann, D.A. & Sutcliffe, K.M. 2011. *Organisational Errors: Directions for future research. MIT.*

Castronovo, C. & Huang, L. 2012. Social Media in an Alternative Marketing Communication Model. *Journal of Marketing Development and Competitiveness,* (6), 117-136.

Cedarville University. 2019. *Microsoft Office: Compatibility mode*. From: https://www.cedarville.edu/help/Microsoft-Office-Compatibility-Mode (accessed 18 February 2019).

Centre for Innovation in Research and Teaching. 2018. *Ethical Considerations*. From: https://cirt.gcu.edu/research/developmentresources/tutorials/ethics(accessed 11 February 2018).

Chadwick, K. 2018. *Supply Chain Organisation: Design for a digital future*. From: https:/ /www.gartner.com/webinar/3838574 (accessed 28 October 2018).

Chamber of Commerce of Metropolitan Montreal. 2018. *Customer Relationship Management*. From: https://Www.Infoentrepreneurs.Org/En/Guides/Customer-Relationship-Management/ (accessed 5 November 2018).

Chappelow, J., 2019. *Porter's 5 Forces Definition.* Investopedia. Accessed 20 February 2021.

Chatterjee, R. 2013. *Breaking the Mold: An educational perspective on diffusion of innovation/rogers' diffusion of innovations.* From: https://en.wikibooks.org/wiki/Breaking_the_Mold:_An_Educational_Perspective_on_Diffusion_of_Innovation/Rogers%E2%80%99_Diffusion_of_Innovations (accessed 11 April 2019).

Chatterjee, R. 2017. *What is the Role of Communication in Supply Chain Management*? From: https://www.quora.com/What-is-the-role-of-communication-in-supply-chain-management (accessed 21 March 2018).

Chauri, P. & Grønhaug, K. 2010.*Research Methods in Business Studies*, 4thedition. London: British Library Cataloguing-in-Publication Data.

Chen, B. 2017. *The Biggest Tech Failures and Successes of 2017.*From: https://www.wral.com/the-biggest-tech-failures-and-successes-of-2017/17183921/ (accessed 4 August 2018).

Chen, H., Hailey, D., Wang, N. & Yu, P. 2018. *A Review of Data Quality Assessment Methods for Public Health Information Systems*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4053886/ (accessed 5June 2018).

Chen, H.C., Sheu, L., O'Sculliavan, P., Cate, O.T. & Teherani, A. 2014. *Workplace-based Learning: Legitimate workplace roles and activities for early learners.* From: https://onlinelibrary.wiley.com/doi/abs/10.1111/medu.12316 (accessed 09 August 2019).

Chen, J. 2014. *Gait Correlation Analysis Based Human Identification*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3925574/ (accessed 18 January 2019).

Christin. 2018. *What is the Best Gmail App for Windows in 2018?* From: https://www.getmailbird.com/best-gmail-app-for-windows/ (accessed 20 May 2018).

Claidio, D. 2016. *Data Communications and IT Components or Elements.* From: http://www.tipsandarticles.com/data-communication-and-components/ (accessed 12 March 2018).

Cloud*, D. 2019. Interpretivism in Sociology: Definition & origin*. From: https://study.com/academy/lesson/interpretivism-in-sociology-definition-and-lesson.html (accessed 28 January 2019).

Cognite, S.S. 2018. *Why is Customer Relationship Management Critical for Growth*? From: https://www.itweb.co.za/content/xA9PO7NY4zOvo4J8 (accessed: 5 November 2018).

Cohen, S. 2018. *The Politics of Technical Complexity.* From: https://blogs.ei.columbia.edu/2018/02/05/politics-technical-complexity/ (accessed 4 August 2018).

Collis, J. & Hussey, R. 2013*. Business Research: A practical guide for undergraduate and postgraduate students*, 4thedition. England: Palgrave Macmillan.

Cooke, N.J. 2018. *Stories of Modern Technology Failures and Cognitive Engineering Successes*. From: https://www.amazon.com/gp/product/0805856714?ie=UTF8&tag=donnorman&linkCode=as2&camp=1789&creative=9325&creativeASIN=0805856714(accessed, 4 August 2018).

Coster, F. 2019. *Business IT Alignment: Business-IT alignment is a discipline that matches IT strategy with business strategy with the goal of maximizing value created by the enterprise. CioWiki.* From: https://cio-wiki.org/wiki/Business_IT_Alignment (accessed 08 April 2019).

Coté. 2016. *Roles and Responsibilities for DevOps and Agile Teams*. From: https://medium.com/@cote/roles-and-responsibilities-for-devops-and-agile-teams-fdacbffb4cb4(accessed 19 December 2018).

Coulson-Thomas, C. 2012. Talent Management and Building High Performance Organisations. *Journal of Industrial and Commercial Training* 44(7):429-436.

Crain, A. 2018. *Cracking the SAFE: An expert's take on the scaled agile framework*. From: https://techbeacon.com/cracking-safe-experts-take-scaled-agile-framework (accessed 19 December 2018).

Crossman, A. 2019. *Positivism in the Study of Sociology: Defining what this theory means.* From: https://www.thoughtco.com/positivism-sociology-3026456 (accessed 19 November 2019).

Csikszentmihalyi, M. & Larson, R. 2014.Validity and Reliability of the Experience-Sampling method in flow and the foundations of positive psychology. *The collected works of Mihaly Csikszentmihalyi.* Springer: Netherlands, pp. 35-54.

Dascalescu, A. 2018. *Biometric Authentication Overview: Advantages & disadvantages: How popular biometric methods work, and how to hack them*. From: https://heimdalsecurity.com/blog/biometric-authentication/# (accessed 5 August 2018).

Dasgupta, P.K. & Kadjo. A. 2013. *Tutorial: Simulating chromatography with Microsoft Excel Macros*. From:https://www.sciencedirect.com/science/article/pii/S000326701 2017321(accessed 26 December 2018).

DataStax 2018. *CQL for Apache Cassandra 3.0 (Earlier version)*. From: https://docs.datastax.com/en/cql/3.3/cql/cql_using/useCreateTable.html (accessed 26 December 2018).

Daudi, M. 2019. The advantage of automating assets management. From: https://www.zenruption.com/zenbusiness/6/30/the-advantages-of-automating-asset-management (accessed 08 February 2021)

David. 2019. *Complete Dissertation by Statistics Solutions: Expert guidance every step of the way.* From: https://www.statisticssolutions.com/what-is-the-difference-between-population-and-sample/ (accessed 27 January 2019).

Davis, F.D., Bagozzi, R.P. & Warshaw, P.1989. User Acceptance of Computer Technology: A comparison of the two theoretical models. *Journal of Management Science,* 35(8):982-1003.

De Beer, A.A., Mpofu, R.T., Cant, M.C., Steenkamp, R.J., Badenhorst-Wess, J.A., Ferreira, D. & Groenewald, D. 2011. *Business Management for Entrepreneurs*. 2nd edition. Cape Town: JUTA.

De Groot, J.A. 2014*. Biometric Security on Body Sensor Networks. Eindhoven University of Technology.* From: https://translate.google.co.za/translate?hl=en&sl=nl&u=https://research.tue.nl/en/publications/biometric-security-on-body-sensor-networks&prev=search (accessed 30 January 2019).

De Oliveira, N.B. & Peres, H.H.S. 2015. *Evaluation of the Functional Performance and Technical Quality of an Electronic Documentation System of the Nursing Process*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458997/ (accessed 19 February 2019).

De Valence, G. 2017. *Market Structure in Building and Construction*. *Oligopolies in a fragmentedindustry.*From:http://gerard-de-valence.blogspot.com/2017/08/market-structure-in-building-and.html(accessed 23 August 2018).

De Vos, A., Strydom, H., Fouche, C.B. & Delpot, C.S.L. 2011. *Research at GrassRoots: For the social sciences and human service professions,* 4th edition. Pretoria: Van Schaik.

Dearing, J.W. 2009. *Applying Diffusion of Innovation Theory to Intervention Development.* NCBI. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957672/ (accessed 11 April 2019).

Del Carpio, J.F. & Miralles, F. 2018*. Absorptive Capacity and Innovation in Low-Tech Companies in Emerging Economies*. From: http://www.jotmi.org/index.php/GT/article/view/2640 (accessed 15 February 2019*).*

Delony, D. 2019. *What is Information Security? - Definition & Best Practices.* From: https://study.com/academy/lesson/what-is-information-security-definition-best-practices.html (accessed 12 June 2019).

Department of Small Business Development: Revised schedule 1 of the national definition of small enterprise in South Africa Act 2. Government Gazette, 15 March 2019, no: 399 (accessed 11 May 2019).

DesMarais, C. 2014. *Why Risk-Takers Do Better in Business and in Life*? From: https://www.inc.com/christina-desmarais/why-risk-takers-do-better-in-business-and-life.html/(Accessed 21 March 2018).

Desmet, D., Maerkedahl, N. & Shi, P. 2014. *Adopting an Ecosystem View of Business Technology*. From: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/adopting-an-ecosystem-view-of-business-technology (accessed 19 February 2019).

Devkota, R. 2018. *Snowball Sampling*. From: https://www.mathstopia.net/sampling/snowball-sampling (accessed 13 November 2018).

Deyto, M. 2015. *6 Benefits of Text Messaging: Why your organisation should use SMS.* From: https://blog.textmarks.com/benefits-of-text-messaging/(accessed 4 June 2018).

Dias, C. *Data Communications and Its Components or Elements.* From: http://www.tipsandarticles.com/data-communication-and-components/ (accessed 5 Aug 2018).

Dillon, A. & Morris, M. 1996a. User Acceptance of New Information Technology: Theories and models. *Journal of* A*nnual Review of Information Science and Technology* 31(2):3-32.

Dillon, A. & Morris, M.G. 2018b. *Acceptance of Information Technology: Theories and models*. From: https://www.ischool.utexas.edu/~adillon/BookChapters/User%20acceptance (accessed 27 April 2018).

Dudovskiy, J. 2019. *Interpretivism (Interpretivist) Research Philosophy.* From: https://research-methodology.net/research-philosophy/interpretivism/(accessed 14 September 2019).

Dudovskiy, J. 2016. *The Ultimate Guide to Writing a Dissertation in Business Studies: A step-by-step assistance*. From: https://research-methodology.net/research-methodology/reliability-validity-and-repeatability/research-validity/ (accessed 23 September 2017).

Duermyer, R. 2017. From: https://www.thebalance.com/entrepreneur-what-is-an-entrepreneur-1794303/ (accessed 3/10/2017).

Duffy, J. 2017. *The Best Productivity Apps of 2018.* From: https://www.pcmag.com/article2/0,2817,2395938,00.asp (accessed: 20 May 2018).

Durcevic, S. 2020. Your Modern Business Guide To Data Analysis Methods And Techniques. From: https://www.datapine.com/blog/data-analysis-methods-and-techniques/, accessed 18 January 2021.

Eberechukwu, A.J. & Chukwuma, A. 2016. Integrated Marketing Communication in Building Customer-Based Brand Equity: A review paper. *International Journal of Management and Economics* 2(3):573-582.

Eckler, P. & Bolls, P. 2011. Spreading the Virus: Emotional tone of viral advertising and its effect on forwarding intentions and attitudes. *Journal of Interactive Advertising* 11(2):1-11.

Elsoudy, M. 2016. *Primary, Secondary and Tertiary Data.* From: https://prezi.com/5g7jhyhhieft/primary-secondary-tertiary-data/ (accessed June 2018).

Filson, C.K. 2018. Comparative Study of Collection Management Practices of Academic Libraries. *Journal of Library Management* 39(1/2):66-77.

Ford, S. 2019. *Building a comprehensive it asset management strategy*. From: https://www.forescout.com/company/blog/building-a-comprehensive-it-asset-management-strategy/ (accessed 08 February 2021).

Fourie, C.J. & Umeh, N.E. 2017. *Application of Lean Tools in the Supply Chain of a Maintenance Environment*. From: http://www.scielo.org.za/scielo.php?script=sciart text&pid=S22247890201700010016 (accessed 03 August 2019).

Gaille, B. 2018. *25 Advantages and Disadvantages of Qualitative Research.* From: https://brandongaille.com/25-advantages-disadvantages-qualitative-research/ (accessed 2 June 2018).

Gitman, L.J., 2015. *Principles of managerial finance*. 2nd Edition, Pearson International Edition. Cape Town: Baseline Publishing Services.

Gitman, L.J. & Zutter, C.J. 2015. Principles of managerial finance. 14th Edition, Pearson International Edition. United States: Malaysia.

Goldenberg, C. & Dyson, D. 2018b. *Demand Flexibility: The key to enabling a low-cost, low-carbon grid oligopolies in a fragmented industry.* From:http://gerard-de-valence.blogspot.com/2017/08/market-structure-in-building-and.html (accessed 23 August 2018).

Green, L.W. Ottoson, J.M., García, C., Hiatt, R.A. & Roditis, M.L. 2015. *Diffusion Theory and Knowledge Dissemination, Utilization and Integration.* From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4524659/ (accessed 11 April 2019).

Grossman, J. 2018. *What are the Advantages and Disadvantages of Biometric Identification?* From: https://www.hunker.com/12491982/what-are-the-advantages-disadvantages-of-biometric-identification (accessed 5 August 2018).

Grothaus, M. 2018. *Amazon is Investigating Employees Leaking Sales Data for Bribes*. From: https://www.fastcompany.com/90237665/amazon-is-investigating-employees-leaking-sales-data-for-bribes (accessed 22 October 2018).

Fatoki, O.O. 2014. Factors Influencing the Financing of Business Start-Ups by Commercial Banks in South Africa*. Mediterranean Journal of Social Science.* 5(20):94-100.

Janvier-James, A.M. 2011. A New Introduction Chain Management: Definitions and theories perspective. *Journal of International Business Research* 5(1). From: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.654.8716&rep=rep1&type=pdf (accessed 16 June 2019).

Hoque, F. 2016. E-enterprise: *Business models, architecture, and components: Breakthroughs in application development*. 1st Edition. From: https://www.amazon.com/Enterprise-Architecture-Breakthroughs-Application-Development/dp/052177487X (accessed 24 July 2018).

Halabisky, 2017. *5 Ways Policy Could Close the Gender Gap in Entrepreneurship*. From: https://www.weforum.org/agenda/2017/10/five-ways-policy-could-close-the-gender-gap-in-entrepreneurship/ (accessed 17 August 2018).

Holzherr, N. 2013. *Even Entrepreneurs Shouldn't Bypass Work Experience*. From: https://www.theguardian.com/careers/nick-holzherr-entrepreneurs-work-experience (accessed 17 August 2018).

Hazen. B.T., Kung, L., Cegielski, C.G. & Jones-Farmer, L.A. 2014. Performance Expectancy and Use of Enterprise Architecture: Training as an intervention. *Journal of Enterprise Information Management* 27(2):180-196.

Heakal, R. 2018. *What are Economies of Scale*? From: https://www.investopedia.com/insights/what-are-economies-of-scale/ (accessed 13 March 2018).

Hebert, P.R. 2012. In Situ Perceptions of a Move: Facility management interns consider scientist end-users at a national lab. *Journal of Facilities Management* 10(2):114-132.

Heizer, J. & Render, B. 2008. *Operations Management,* 9thedition. New Jersey: Upper Saddle River.

Hersey, P. & Blanchard, K. 2017. *Business Dictionary*. From: http://www.businessdictionary.com/definition/business-resources.html/ (accessed 3/10/2017).

Hickey, K. 2015. *The Role of an Enterprise Architect in a Lean Enterprise*. From: https://martinfowler.com/articles/ea-in-lean-enterprise.html (accessed 5 November 2018).

Hillstrom, L.C. 2018. *Value Creation*. From: http://www.referenceforbusiness.com/management/Tr-Z/Value-Creation.html (accessed 15 May 2018).

Hamid, A. 2016. *Work Experience through Social Entrepreneurship.* From: http://coins foundation.org/blog/work-experience-through-social-entrepreneurship/ (accessed 17 August 2018).

Hackman, L.C. &Knowlden, A.P. 2014. *Theory of Reasoned Action and Theory of Planned Behavior-Based Dietary Interventions in Adolescents and Young Adults: A systematic review. Dove press*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC4057331/ (accessed 6 August 2019).

Hagmann, J. 2013. Information Governance beyond the Buzz. *Journal of Records management* 23(3):228-240.

Hair, H., Boshoff, M. & Klopper, T.E. 2015 *Marketing,* 4thedition. Cape Town: Oxford.

Hamel, G. 2019. *Legal Constraints on a Business*. From: https://smallbusiness.chron. com/legal-constraints-business-23712.html (accessed 05 February 2019).

Hamlett, K. 2018. *About Management Information Systems.* From: http://small business.chron.com/management-information-systems-3957.html (accessed 24 May 2018).

Han, J.H., Wang, Y. & Naim. M. 2018. *Reconceptualization of Information Technology Flexibility for Supply Chain Management: An empirical study.* From: https://www. sciencedirect.com/science/article/pii/S0925527317300555(accessed, 4 August 2018)

Harvey, C.R. 2012. *External Finance: The free dictionary.* From: https://financial-dictionary.thefreedictionary.com/External+finance (accessed 10 June 2019).

Hawks, D. 2019. *External Factors of a Business: Definition & explanation*. From: https://study.com/academy/lesson/external-factors-of-a-business-definition-lesson-quiz.html (accessed 10 February 2019).

Hellriegel. D., Slocum. J.W., Jackson. S.E., Staude, L.L.G., Amos, T., Klopper, H.B., Oosthuizen, M.L., Perks, S. & Zindiye, S. 2012. *Management*, 4th Edition. Pretoria: Oxford Publishers.

Hendricks, D. 2018. *Being an Entrepreneur Can Prove Difficult, But Understanding These 10 Traits of Other Successful Entrepreneurs Should Help.* From: https://www.inc.com/drew-hendricks/10-habits-of-the-successful-entrepreneur.html (accessed 9 May 2018).

Herman, E. & Stefanescu, D. 2017. Can Higher Education Stimulate Entrepreneurial Intentions among Engineering and Business Students? *Journal of Educational Studies* 43(3), pp.312-327.

Holden, R.J. 2010. *The Technology Acceptance Model: Its past and its future in health care.* From: https://www.sciencedirect.com/science/article/pii/S1532046409000963 (accessed 3 June 2018).

Hon, A.H.Y. & Lui., S.S. 2016. Employee Creativity and Innovation in Enterprises: Review, integration, and future directions for hospitality research. *International journal of contemporary hospitality management* 28(5):862-885. From:https://cirt.gcu.edu/research/developmentresources/research_ready/quantresearch/sample_meth (accessed 13 November 2018).

Hordos, L. 2018. *What is the Definition of Job Performance?* From: https://bizfluent.com.info-7856570-definition-job-performance.html (accessed 04 July 2020).

Hughes, J.A. & Sharrock, W.W. 2016. *The Philosophy of Social Research,* 3rd edition. London: Imprint Routledge. From: https://doi.org/10.4324/9781315840710 (accessed 28 September 2019).

Hwang, D. & Min. H. 2015: Identifying the Drivers of Enterprise Resource Planning and Assessing Its Impacts on Supply Chain Performances. *Journal of Industrial Management and Data Systems* 115(3): 541-569.

Hyde, M. 2018. *Andre Marriner Debacle Highlights FIFA Aversion to Video Technology*. From: https://www.theguardian.com/football/blog/2014/mar/26/andre-marriner-referee-fifa-video-technology(accessed 5 August 2018).

Ingram, S.V., 2017. *Call to the post: An analysis of Montgomery County equine operators' motivation for adoption of conservation practices* (Doctoral dissertation, Kansas State University).

Ingram, D. (2018). About Supply Chain Management Systems. https://smallbusiness.chron.com/supply-chain-management-systems-43344.html, (accessed 28 October 2018).

Ismail, N. 2018. *A CTO Guide to Digital Transformation in Financial Services.* From: https://www.information-age.com/cto-guide-digital-transformation-financial-services-123474478/(accessed, 5 August 2018).

Ittana. 2018. 23 *Advantages and Disadvantages of Qualitative Research.* From: https://vittana.org/23-advantages-and-disadvantages-of-qualitative-research (accessed 22 June 2018).

Jacobson, L. 2018. *Computer System Components: Computer parts & functions*. From: https://study.com/academy/lesson/computer-system-components-computer-parts-functions.html (accessed 20 May 2018).

James, B.F. &Kim, J.D. 2018. *Most Successful Entrepreneurs are Older than You Think.* From: http://theconversation.com/most-successful-entrepreneurs-are-older-than-you-think-95402(accessed: 17 August 2018).

Javan, M. 2019. Must-Have Small Business Software and Tech Tools. https://smesouthafrica.co.za/small-business-software-tools/ (accessed 25 February 2021).

Jenic, I. 2018. *Best Free Android Emulators for Windows 10/8.1/7.* From: https://windowsreport.com/best-android-emulators-windows-10/ (accessed 20 May 2018).

Jones-Imhotep, E. 2018. *Natural Disasters and Technological Failures*. From: https://edwardjonesimhotep.com/2018/04/02/natural-disasters-and-technological-failures/(accessed 4 August 2018).

Kahraman, C., Kaya, H. & Çevikcan, E. 2011. Intelligence Decision Systems in Enterprise Information Management. *Journal of Enterprise Information Management* Vol. 24(4)360–379.

Kamleitner, B., Korunka, C. & Kirchler, E. 2012. Tax Compliance of Small Business Owner's: A review. *International Journal of Entrepreneurial Behavior & Research* 18(3):330-351.

Kamleitner, B., Korunka, C. & Kirchler, E. 2012. Tax compliance of small business owner's: A review. *International Journal of Entrepreneurial Behavior & Research*. 18(3)330-351.

Karim, A.J. 2011. The Significance of Management Information Systems for Enhancing Strategic and Tactical Planning. *Journal of Information Systems and Technology Management*.8(2).

Kayo, A. 2018. *The Uses of Mainframe Computers.* From: https://www.techwalla.com/articles/the-uses-of-mainframe-computers (accessed 20 May 2018).

Kehring, D. 2018. *Finance and HR.* From: https://go.oracle.com/LP=67231?elqCampaignId=52212&src1=ad:pas:go:dg:hcm&src2=wwmk160606p00115c0014&SC=sckw=WWMK160606P00115C0014&mkwid=sS1GZ9MBS%7cpcrid%7c265000317580%7cpkw%7cbusiness%20finance%7cpmt%7cp%7cpdv%7cc%7csckw=srch:business%20finance (accessed 15 May 2018).

Keith, F.P. 2014. *Introduction to Social Research: Qualitative and quantitative approaches,* 3rd edition. London: SAGE Publication Inc.

Kelly, K. 2018. *How to Combine Word Documents & Maintain Different Headers*. From: http://smallbusiness.chron.com/combine-word-documents-maintain-different-headers-54802.html (Accessed 3 June 2018).

Kelly, L., Kerr, G. & Drennan, J. 2010. *Avoidance of Advertising in Social Networking Sites. The Teenage Perspective Journal* 10(2):16-27.

Kent, D.M., & Tsang, E.W.K. 2010. *Testing Management Theories: Critical realist philosophy and research methods.* From: https://doi.org/10.1002/smj.868 (accessed 11 May 2019).

Ketteni, E., Mamuneas, T. & Stengos, T. 2011. *The Effect of Information Technology and Human Capital on Economic Growth.* From: https://www.cambridge.org/core/

journals/macroeconomic-dynamics/article/effect-of-information-technology-and-human-capital-on-economic-growth/B39EE14413BE604D13D81602C7C524F8 (accessed 27 January 2019).

Khalifa, A.B. 2016. *Determinants of Information and Communication Technologies Adoption by Tunisian Firms*. From: https://www.cairn.info/revue-journal-of-innovation-economics-2016-2-page-151.htm# (accessed 15 February 2019).

Kharytonov, S. & Sukholeyster, O. 2012. *Enterprise IT Architecture: Goals, trends and perspectives*. From: http://sandhill.com/article/enterprise-it-architecture-goals-trends-and-perspectives/ (accessed 19 December 2018).

Kihn, S. 2018. *Common Mistakes Made When Using email.* From: http://careerminer.infomine.com/common-mistakes-made-when-using-email/, (accessed 10 May 2018).

Kim, H.Y. 2014. *Analysis of Variance (ANOVA) Comparing Means of More Than Two Groups*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3916511/ (accessed 06 August 2019).

Kirlidog, M. & Kaynak, A. 2013.*Technology Acceptance Model and Determinants of Technology Rejection*. From: https://www.igi-global.com/chapter/technology-acceptance Z-model-determinants-technology/73603(accessed 11June 2018).

Kivunja, C. & Kuyini, A.B. 2017. *Understanding and Applying Research Paradigms in Educational Context.* From: https://files.eric.ed.gov/fulltext/EJ1154775.pdf (accessed 28 September 2019).

Klein, M. 2014. *Tables and Other Formatting Controls.* From: https://www.howtogeek.com/school/microsoft-word-document-formatting-essentials/lesson3/ (accessed 26 December 2018).

Knight, D. 2014. *Welcome to Low End Mac: Personal computer history: 1975-1984.* From: http://lowendmac.com/2014/personal-computer-history-the-first-25-years/ (accessed: 20 May 2018).

Knox, C.C. & Haupt, B. 2015. Incorporating Cultural Competency Skills in Emergency Management Education*: Journal of Disaster Prevention and Management* 24(5), pp.619-634.

Kocoglu, D. & Kirmaci, S.K. 2012. Banking Sector Performance. *Journal of Research in Humanities & Social Sciences* 3(2):33-35.

Kooser, A.C. 2018. *Advantages and Benefits of Email for a Business.* From: http://smallbusiness.chron.com/advantages-benefits-email-business-846.html (accessed 7 May 2019).

Kousar, S. 2017. *Technological Factors and Adoption of Green Innovation-Moderating Role of Government Intervention: A case of SMEs in Pakistan*. From: https://www.researchgate.net/publication/324834766_Technological_Factors_and_Adoption_of_

Green_Innovation-Moderating_Role_of_Government_Intervention_A_Case_of_SMEs_in_Pakistan/figures?lo=1 (accessed 02 April 2019).

Kowalczyk, D. 2019. *What is Informed Consent in Research? Definition & purpose.* From: https://study.com/academy/lesson/what-is-informed-consent-in-research-definition-purpose.html (accessed 29 January 2019).

Kozicki, L. 2017. *What is the Role of Communication in Supply Chain Management*? From: https://www.quora.com/What-is-the-role-of-communication-in-supply-chain-management (accessed 21/03/2018).

Kraemer-Eis, H., Botsari, A., Gvetadze, S., Lang, F. & Torfs, W. 2018. *European Small Business Finance Outlook.* From: https://www.econstor.eu/handle/10419/180655 (accessed 21 July 2019).

Kramer, L. 2018. *What are Common Examples of Monopolistic Markets?* From: https://www.investopedia.com/ask/answers/041415/what-are-common-examples-monopolistic-markets.asp (accessed 23 August 2018).

Krishnaraju, V. & Mathew, S.K. 2013. Web Personalization Research: An information systems perspective. *Journal of Systems and Information Technology*, Vol. 15(3)254-268.

Kruger, N. 2016. *South Africa Has a Skills Shortage: How do we fix it*? From: https://www.weforum.org/agenda/2016/05/south-africa-skills-shortage-how-do-we-fix-it/ (accessed 27 January 2019).

Kshetri, 2019. *Diffusion Pattern of Linux: An assessment on major technology dimensions*. From: https://firstmonday.org/article/view/1263/1183 (accessed 18 February 2019).

Kshetri, 2019. *Diffusion Pattern of Linux: An assessment on major technology dimensions*. From: https://firstmonday.org/article/view/1263/1183 (accessed 18 February 2019).

Kubberød, E. & Pettersen, I.B. 2018. The Role of Peripherality in Students' Entrepreneurial Learning, *Education & Training*, Vol. 60(1)2-15.

Kuehnhausen, M. & Frost, V.S. 2011. Transportation Security Sensornet: A service-oriented architecture for cargo monitoring", *Journal of Systems and Information Technology* 13(4).

Kuhn, K., Galloway, T. & Collins-Williams, M. 2016. Near, Far and Online: Small business owner's advice-seeking from peers. *Journal of Small Business and Enterprise Development.* 23(1)189-206.

Kumar, C.C.S. 2000. An Application of a System Analysis Methodology to Manage Logistics in a Textile Supply Chain. *An International Journal of Supply Chain Management*, Vol. 5 (5)234 – 245.

Kuntz, J., Connell, P. & Näswall, K. 2017. Workplace Resources and Employee Resilience: The role of regulatory profiles. *International Journal of Career Development* 22(4): 419-435.

Leydesdorff, L. 2000. *Complexity and Technology*. From: https://www.leydesdorff.net/compltech/ (accessed 4 August 2018).

Ladner, S. 2018. *Sampling Methods in Qualitative and Quantitative Research. Sampling Methods.*

Lamb, C.W., Hair, J.F., McDaniel, C., Boshoff, C. & Terblanche, N. 2019. *Marketing,* 5th edition. Cape Town: Oxford.

LaMorte, W.W. 2018. *Diffusion of Innovation Theory. Boston University School of Public Health.* From: http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html (accessed 02 April 2019).

Landgraf, M. 2016. *Risk Aversion Impedes Innovation in Information Technology.* From: http://www.kit.edu/kit/english/pi_2016_060_risk-aversion-impedes-innovation-in-information-technology.php (accessed 6 September 2018).

Lani, J. 2018. *ANOVA (Analysis of Variance*). From:http://www.statisticssolutions.com/manova-analysis-anova/ (accessed 29 April 2018).

Laudon, K.C. & Laudon, J.P. 2018. *Management Information Systems: Managing the digital SMEs,* 15th Edition. New York University: Person Education.

Lawrence, B. 2017. *Nine Competencies for HR Excellence Emerge*. From: https://www.hrci.org/community/blogs-and-announcements/hr-leads-business-blog/certification-matters/2017/04/04/nine-competencies-for-hr-excellence-emerge (accessed 20 May 2018).

Lee, E. & Rhim, H. 2014. An Application of Conjoint Analysis to Explore User Perceptions on Management Information Systems: A case study. *Journal of Management Research Review* 37(1):69-88.

Learch, J.C. & Melicher R.W. 2018. Enterpreneurial Finance. 6th Edition. Cengage Learning. United States of America.

Lechesa M., Seymour L., Schuler J. (2012) ERP Software as Service (SaaS): Factors Affecting Adoption in South Africa. In: Møller C., Chaudhry S. (eds) Re-conceptualizing Enterprise Information Systems. Lecture Notes in Business Information Processing, vol 105. Springer, Berlin, Heidelberg. From: https://doi.org/10.1007/978-3-642-28827-2_11 (accessed 25 February 2021).

Leedy, P.D. & Ormrod, J.E. 2014. *Practical Research, Planning and Design,* 10th edition. United States of America: British Library Cataloguing-in-publication data. From: https://cirt.gcu.edu/research/developmentresources/researchready/quantresearch/sample_meth (accessed 13 November 2018).

Leenes, R., Palmerini, E., Koops, B.J., Bertolini, A., Salvini, P. & Lucivero. 2017. *Regulatory Challenges of Robotics: Some guidelines for addressing legal and ethical issues.*From:https://www.tandfonline.com/doi/full/10.1080/17579961.2017.1304921 (accessed 05 February 2019).

Leonard, K. 2018. *Examples of Core Competencies of a Human Resource Manager.* From: http://smallbusiness.chron.com/examples-core-competencies-human-resource-manager-10027.html (accessed 20 May 2018).

Liedtke, L. 2019. *SME Sector 'Critical' to Growing South Africa's Economy – Pityana.* From: https://www.engineeringnews.co.za/article/sme-sector-critical-to-growing-south-africas-economy-pityana-2019-04-11 (accessed 29 July 2019).

Lin, V. 2016. *Three Tips to Reduce Your Supplier Lead Time*. From: https://www.tradegecko.com/blog/supply-chain-management/three-tips-to-reduce-your-supplier-lead-time (accessed 03 August 2019).

Little, L. 2010. Talent Management and Its Technological Partners. *Journal of Industrial and Commercial Training* 42(7):389-393.

Liu, Y. 2017. *Risk-Taking and Persistence Make Successful Entrepreneurs, says Sequoia's Shen*. From: http://www.scmp.com/business/money/markets-investing/article/2113463/risk-taking-and-persistence-make-successful/ (accessed 21/03/2018).

Lobiondo-Wood, G., & Haber, J. 2013. *Nursing Research in Canada: Methods, critical appraisal, and utilization,* 3rdedition. Canada.

Lombardo, C. 2018. *17 Advantages and Disadvantages of Random Sampling*. From: https://vittana.org/17-advantages-and-disadvantages-of-random-sampling (accessed 14 November 2018).

Lorette, K. 2018. *Sources of Finance for a Partnership*. From: http://smallbusiness.chron.com/sources-finance-partnership-3663.html (accessed 15 May 2018).

Lund Research Ltd. 2012. *Stratified Random Sampling*. From: http://dissertation.laerd.com/stratified-random-sampling.php#step5, (accessed 19 November 2018).

MacVaugh, 2019. *Limits to the Diffusion of Innovation: A literature review and integrative model.* From: https://www.emeraldinsight.com/doi/full/10.1108/14601061011040258 (accessed 11 April 2019).

Marais, J. 2018. *Policy and Regulations: SA 'completely out of step' with global SME growth trends.* From: https://www.businesslive.co.za/bd/business-and-economy/2018-07-25-sa-completely-out-of-step-with-global-sme-growth-trends/ (accessed 29 July 2019).

Martin, G. 2019. *The Meaning and Origin of the Expression: Carbon-copy. Phrase Finder. Phrases*. From: https://www.phrases.org.uk/meanings/carbon-copy.html (accessed 16 June 2019).

Martínez, R.A. 2017. *The Importance of the Languages of Scientific Publications: Main types of limitations.School of authors.* From: https://schoolofauthors.wordpress.com/2017/04/07/main-types-of-limitations/ (accessed 01 April 2019).

Matin, M.A. & Islam, M.M. 2012. *Open Access Peer-Reviewed Chapter: Overview of wireless sensor network. intecopen.* From: https://www.intechopen.com/books/wireless-sensor-networks-technology-and-protocols/overview-of-wireless-sensor-network (accessed 16 June 2019).

McKinlay, J., Pithouse, D., McGonagle, J. & Sanders, J. 2018. *Blockchain: Background, challenges and legal issues*. From: https://www.dlapiper.com/en/denmark/insights/publications/2017/06/blockchain-background-challenges-legal-issues/ (accessed 05 February 2019).

Merrick, P. & Allen, C. 2018. *Web Interface Definition Language (WIDL). W3C. Web Interface Definition Language (WIDL)* (accessed 12 June 2019).

Merritt, T. 2019. Top 5: *Ways to End Resistance to Digital Transformation.* From: https://www.techrepublic.com/article/top-5-ways-to-end-resistance-to-digital-transformation/ (accessed 10 May 2019).

Mitchell, B. 2019. *What is a Wide Area Network (WAN)? What is a wan and how does it work? Lifewire.* From: https://www.lifewire.com/wide-area-network-816383 (accessed 09 August 2019).

Mkansi, M. & Acheampong. E.A. 2012.Research Philosophy Debates and Classifications: Students' Dilemma. Journal of business research methods provides perspectives on topics relevant to research in the field of business and management. 10(2):132-140). From: http://www.ejbrm.com/front/search/index.html (accessed 28 September 2019).

Mlangeni, T. 2017. *Youth Development Strategy, An Entrepreneurial Programme Launched in Mbombela: Minister Lindiwe Zulu says the youth needs to be clever, smart and educated to enter into the business world.* Mpumalanga news. From:https://mpumalanganews.co.za/308951/youth-development-strategy-entrepreneurial-programme-launched-mbombela/ (accessed 15 April 2019).

Montilva, J., Barrios, J. & Besembel, I. 2014. *A Business Process Model for IT Management Based on Enterprise Architecture*. From: http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S0717-50002014000200004 (accessed 06 Feb 2019).

Marshall, P.A., Adebamowo, C.A., Ogundrian, T.O., Vekich, M., Strenski, T., Zhou & Maurer, R. 2018. *More Employers are Using Biometric Authentication: But security concerns mean that passwords aren't going away just yet*. From:

https://www.shrm.org/resourcesandtools/hr-topics/technology/pages/employers-using-biometric-authentication.aspx (accessed 18 January 2019).

Mayhew, S. 2019. *What is Fingerprint Identification?* From: https://www.biometricupdate.com/201205/what-is-fingerprint-identification (accessed 18 January 2019).

McDonald, M. & Conner, N. 2018. *The Missing Manual*. From: https://www.oreilly.com/library/view/office-2013-the/9781449359416/ch04.html, (accessed: 26 December 2018).

Morgado, F.F.R., Juliana, F.F., Meireles, J.F.F., Neves, C.M., Amaral, A.C.S. & Ferreira, M.E.C. 2017. *Scale Development: Ten main limitations and recommendations to improve future research practices*. Scielo. From: http://www.scielo.br/scielo.php?script=sciarttext&pid=S0102-79722017000103301 (accessed 01 April 2019).

Morosan, C. 2011*. Opportunities and Challenges for Biometric Systems in Travel: A review. University of Massachusetts Amherst: International Conference*. From: https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1686&context=ttra (accessed 30 January 2019).

Mulder, P. 2012. *Diffusion of Innovations Theory.* From: https://www.toolshero.com/marketing/diffusion-of-innovations-rogers/ (accessed 26 February 2019).

Mulder, P. 2019. *Business IT Alignment.* From: https://www.toolshero.com/strategy/business-it-alignment/ (accessed 08 April 2019).

Mulesoft. 2009. *Financial Services and Legacy Systems.* From: https://www.mulesoft.com/resources/esb/financial-services-legacy-systems-modernization (accessed 6 February 2019).

Mutoko, W.R. & Kapund, S.M. 2017. *Factors Influencing Small, Medium and Micro-Sized Enterprises' Borrowing from Banks: The case of the Botswana manufacturing sector. Scielo.* From: http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1684-19992017000100013 (accessed 15 April 2019).

Mzekandaba, S. 2018a. *Government Steps up SME Support.* From:https://www.itweb.co.za/content/JN1gPvO16JrMjL6m (accessed 29 July 2019).

Mzekandaba, S. 2018b. *Union Takes Issue with SASSA Biometrics*. From: https://www.itweb.co.za/content/KA3WwMdlORoMrydZ (accessed 2 December 2018).
Mayhew, S. 2019. *What is Fingerprint Identification*? From: https://www.biometricupdate.com/201205/what-is-fingerprint-identification (accessed 18 January 2019).

Murphy, B. 2018. *What are the Pros and Cons of Stratified Random Sampling*? From: https://www.investopedia.com/ask/answers/041615/what-are-advantages-and-disadvantages-stratified-random-sampling.asp (accessed 14 November 2018).

Martin, M. 2017. *Porter's Five Forces: Analyzing the Competition*. From: https://www.businessnewsdaily.com/5446-porters-five-forces.html (accessed 21/03/2018).

Manning, T. & Robertson, R. 2015. Explorations into Sex, Gender and Leadership in the UK Civil Service Part 2: Hypotheses and research findings*. Journal of Industrial and Commercial Training* 47(6):310 – 319.

Mathaisel, D.F.X. 2013. A Lean Architecture for Transforming the Aerospace Maintenance, Repair and Overhaul (MRO) Enterprise. *International Journal of Productivity and Performance Management* 54(8):62-644.

Metcalf, A. 2015. Nationwide Training Limited were Chosen by Action for Blind People to Design an ILM Middle Manager Leadership and Management Programme. *Journal of Industrial and Commercial Training* 47(6):326 – 329.

Mills, J., Purchase, V.C. & Parry, G. 2013. Enterprise Imaging: Representing complex multienterprise service enterprises. *International Journal of Operations & Production Management* 33(2):159-180.

Mantzana, V., Themistocleous, M. & Morabito, V. 2010. Healthcare Information Systems and Older Employees' Training. *Journal of Enterprise Information Management*. (23)6:680-693.

Mohamed, N., Kaur, J. & Singh, G. 2012. A Conceptual Framework for Information Technology Governance Effectiveness in Private Enterprises. *Journal of Information Management & Computer Security* 20(2):88-106.

Mishra, S. 2015. Enterprise Objectives for Information Security Governance: A value focused assessment. *Journal of Information & Computer Security* 23(2):122-144.

Mantzana, V., Themistocleous, M. & Vincenzo, M. 2010. Healthcare Information Systems and Older Employees' Training. *Journal of Enterprise Information Management*, Vol. 23(6):680-693.

Markgraf, D. 2018.*Describe the Three Levels of Strategy for a Single-Business Company*. From: http://smallbusiness.chron.com/describe-three-levels-strategy-singlebusiness-company-23508.html (accessed 12 May 2018).

Marks, G. 2018. *Sorry, Millennials: The average age of a successful entrepreneur is a lot older than you think*. From: https://www.washingtonpost.com/news/on-small-business/wp/2018/04/24/sorry-millennials-the-average-age-of-a-successful-entrepreneur-is-a-lot-older-than-you-think/?noredirect=on&utm_term=.2872f42d5762 (accessed: 17 August 2018).

McLaughlin, L. 2016. *How to Work with Executive Recruiters.* From: http://www.businessdictionary.com/article/1266/work-executive-recruiters-wsj1604/ (accessed 24 May 2018).

McPeak, D. 2018. *Strengthening Organisations: Advancing economies. Revised definition of the professional accountant.* From: https://www.iaesb.org/projects/revised - definition-professional-accountant, Strengthening Organisations, Advancing Economies (accessed 5th June 2018).

Magubane, K. 2018. *Finance Minister Tito Mboweni Demands Consequences for VBS 'bank heist.* From: https://www.fin24.com/Economy/finance-minister-demands-consequences-for-vbs-bank-heist-20181016-2 (accessed 22 October 2018).

Maverick, 2018. *Which Types of Industries Have the Largest Capital Expenditures? From*: https://www.investopedia.com/ask/answers/020915/which-types-industries-have-largest-capital-expenditures.asp (accessed 4 June 2018).

McKinlay, J., Pithouse, D., McGonagle, J. & Sanders, J. 2018. *Blockchain: Background, challenges and legal issues*. From: https://www.dlapiper.com/en/denmark/insights/publications/2017/06/blockchain-background-challenges-legal-issues/ (accessed 05 February 2019).

Michael, M. & Mike, P. 2014. Refurbished IBM Mainframes. From: https://simonsys.com/?gclid=EAIaIQobChMI3tuyuIWU2wIVloXVCh1auwPJEAMYASAAEgL05_D_BwE (accessed 20 May 2018).

Misra, V., Khan, I.M. & Singh, U.K. 2010. Supply Chain Management Systems: Architecture, design and vision. *Journal of Strategic Innovation and Sustainability* 6(1):96–101.

Moran, R. 2016. *Mainframe or Personal Computers.* From: http://www.roymoran.com/personal-computer-vs-main-frame/ (accessed 19 June 2018).

Mote. S. 2017. *Four Types of Entrepreneurship: Because one definition does not fit all*. From: https://www.kcsourcelink.com/blog/blog/2017/01/30/four-types-of-entrepreneurship-because-one-definition-does-not-fit-all (accessed 20 August 2018).

MTN Group. 2019. Group SCM Overview. From: https://www.mtn.com/en/mtn-group/supplier/Pages/default.aspx (accessed 20 February 2019).

Muhamad, A. 2018. *Analyzing Quantitative Research.* https://cirt.gcu.edu/research/developmentresources/research_ready/quantresearch/analyze_data (accessed 19 June 2018).

Murthy, S.R. & Mani, M. 2013. *Discerning Rejection of Technology.* From: http://journals.sagepub.com/doi/pdf/10.1177/2158244013485248 (accessed 4 Aug 2018).

Mustafa, E., Yusof, K.N. & Iranmanesh, M. 2016. Innovation Creation, Innovation Adoption, and Firm Characteristics in the Construction Industry. *Journal of Science & Technology Policy Management* 7(1).

Naim, M.F. & Lenka, U. 2017. Talent Management: A burgeoning strategic focus in Indian IT industry. *Industrial and Commercial Training* 49(4):183-188.

Nair, P.R. 2010. *Benefits of Information Technology Implementations for Supply Chain Management: An explorative study of progressive Indian companies*. From: https://www.igi-global.com/chapter/benefits-information-technology-implementations-supply/42266 (accessed 25 February 2019).

Najafabadi, M.I. & Aziz, N.A. 2013. *Homogeneous Charge Compression Ignition Combustion: Challenges and proposed solutions.* From: https://www.hindawi.com/ journals/jc/2013/783789/ (accessed 08 April 2019).

Naser, D. 2018. *Application-Driven Advances in Multi-Biometric Fusion*. From: http:// tuprints.ulb.tu-darmstadt.de/7324/ (accessed 30 January 2019).

National Academy of Sciences Engineering Medicine. 2009. *Introduction to instrumentation*. From: https://www.nap.edu/read/11520/chapter/4 (accessed 29 Jan 2019).

Naudé, W. & Minniti, M. 2011. *Examining the Entrepreneur Gender Gap*. From: https:// unu.edu/publications/articles/examining-entrepreneur-gender-gap.html#info, (accessed: 17 August 2018).

Nazir, M. & Zhu, X. 2018. *E-commerce Adoption Factors Affecting the SMEs*: *A case study investigation of a developing economy-Pakistan*. Scholar Teesside University: Business School Teesside University United Kingdom. From: https://research.tees.ac.uk/en/publications/e-commerce-adoption-factors-affecting-the-smes-a-case-study-inves (accessed 18 May 2019).

Nel, N.M., Tlale, L.D.N, Engelbrecht, P. & Nel, M. 2016. *Teacher's Perfections of Education Support Structures in the Implementation of Inclusive Education in South Africa.* From: http://www.scielo.org.za/pdf/koers/v81n3/03.pdf (accessed 16 June 2019).

Nemoto, T, and Beglar, D. 2014. Developing Likert-scale questionnaires. In Sonda, N. and Krause (Eds.), A. JALT2013 Conference Proceedings. Tokyo. From: https://jalt-publications.org/files/pdf-article/jalt2013_001.pdf (accessed 19 December 2020).

Ness, L. 2008. *Exploring Information Technology Flexibility and Increased Complexity: is Management Prepared?* From: https://www.researchgate.net/publication/254718478_Exploring_Information_Technology_Flexibility_and_Increased_Complexity_Is_Management_Prepared(accessed 4 August 2018).

Neubauer, K. 2009.*Advantages and Disadvantages of Different Column Types for Speciation Analysis by LC-ICP-MS*. From: http://www.spectroscopyonline.com/advantages-and-disadvantages-different-column-types-speciation-analysis-lc-icp-ms (accessed 26 December 2018).

Neurosc, R.N. 2017. *Restorative Neurology and Neuroscience: Waist-up protection for blind individuals using the EyeCane as a primary and secondary mobility aid*. NCBA. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5366249/ (accessed 16 June 2019).

Newlands, M. 2018. *Managing Your Personal Finances as an Entrepreneur: 14 tips from leading experts.*From:https://www.inc.com/murray-newlands/managing-your-personal-finances-as-an-entrepreneur-14-tips-from-leading-experts.html (accessed 15 May 2018).

Nickolaisen, N. 2018. *Why an Enterprise Application Architecture Strategy is Still Needed*. From: https://searchcio.techtarget.com/tip/Why-an-enterprise-application-architecture-strategy-is-still-needed (accessed 6 November 2018).

Nieman, G.H. 2013. *Small Business Management: A South African approach.* Pretoria: Van Schaik.

Nimsaj, J. 2016. *Executive Support Systems*. From: https://prezi.com/wdnjhpiyinm9/executive-support-system/ (accessed 24 May 2018).

Nkosi, S. 2019. *A Capable State to Support Small Business.* From: https://city-press.news24.com/Business/a-capable-state-to-support-small-business-20190321 (accessed 29 July 2019).

Nordmeyer, B. 2019*. Three Different Types of Enterprise Systems.* From: *https://small business.chron.com/three-different-types-enterprise-systems-73267.html* (accessed February 2019).

Ntalianis, F., Dyer, L. & Vandenberghe, C. 2015. Owner-Employee Relations in Small Firms. *Journal of Managerial Psychology* 30(7):832-846.

O'Gorman, K.D. & MacIntosh, R. 2015. *Chapter 4 Mapping Research Methods.* From: https://www.goodfellowpublishers.com/academicpublishing.php?promoCode=&partnerID=&content=doi&doi=10.23912/978-1-910158-51-7-2772 (accessed 28 Sept 2019).

Olsson, A., Skovdahl, K. & Engström, M. 2016. *Using Diffusion of Innovation Theory to Describe Perceptions of a Passive Positioning Alarm among Persons with Mild Dementia: A repeated interview study.* US National Library of Medicine. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4706660/ (accessed 11 April 2019).

Oyugi, C., Nocera, J.A., Dunckley, L. & Dray, S. 2008. *The Challenges for Participatory Design in the Developing World.* From: https://dl.acm.org/citation.cfm?id=1795308 (accessed 08 April 2019).

Pashaei, S. & Olhager, J. 2015. Product Architecture and Supply Chain Design: A systematic review and research agenda*. An International Journal of Supply Chain Management*: 20(1): 98–112.

Pristine, P. 2017.*Different Types of Financial Models for Financial Modelling.* From:https://www.edupristine.com/blog/different-types-financial-models-financial-modelling (accessed 31 July 2019).

Rafeedalie, E. 2019. *Positivist and Non-Positivist Paradigm of Research as a Generating Knowledge. Top Hat: Marketplace. From*: https://tophat.com/marketplace/social-science/education/course-notes/oer-positivist-and-non-positivist-paradigm-of-research-dr-rafeedalie/1192/ (accessed 14 September 2019).

Ramlee, S. & Berma. B. 2013. *Financing Gap in Malaysian Small-Medium Enterprises: A supply-side perspective.* From: http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S22223436201300050012 (accessed 27 January 2019).

Rampersad, G., Plewa, C. & Troshani, I. 2012. *Investigating the Use of Information Technology in Managing Innovation: A case study from a university technology transfer office*. From:https://www.sciencedirect.com/science/article/pii/S0923474811000403(accessed 27 January 2019).

Ray, S. 2015. Analytics Vidhya. *Commonly Used Machine Learning Algorithms (with Python and R Codes).* From: https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-algorithms/(accessed 03 August 2019).

Reichert, F.M. & Zawislak, P.A. 2014. Technological Capability and Firm Performance*. Journal of Technology Management & Innovation*versión On-line ISSN 0718-2724. From: https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-27242014000400002 (accessed 10 June 2019).

Rehman, M.H., Majumdar, S. & Krishna, C.Y.S. 2017. Assessment of factors impacting customer buying behaviour in software product companies. *IUJ Journal of management*, *5*, pp.21-25. From: https://scholar.google.com/citations?user=3GsDGCMAAAAJ&hl=en#d=gs_md_cita-d&u=%2Fcitations%3Fview_op%3Dview_citation%26hl%3Den%26user%3D3GsDGCMAAAAJ%26citation_for_view%3D3GsDGCMAAAAJ%3AhqOjcs7Dif8C%26tzom%3D-120 (accessed 21 November 2020).

Rhodes, P. & Bryant, J.H. 2019. *Public Health. Encyclopaedia Britannica*. From: https://www.britannica.com/topic/public-health (accessed 02 April 2019).

Russel, J.E.A. 2013. *How to Create Change in the Workplace*. From: https://www.washingtonpost.com/business/capitalbusiness/how-to-create-change-in-the-workplace/2013/11/27/9d62f8de-5548-11e3-835d-e7173847c7cc_story.html?noredirect=on&utm_term=.2958a573402e (accessed 25 February 2019).

Ruhl, J.B. & Katz, D.M. 2015.Measuring, Monitoring and Managing Legal Complexity. *Lowa Law Review.* From:https://ilr.law.uiowa.edu/print/volume-101-issue-1/measuring-monitoring-and-managing-legal-complexity/ (accessed 10 June 2019).

Rosenberg, A. 2011. *Philosophy of Science: A contemporary introduction,* 3rd edition. New York. From: https://doi.org/10.4324/9780203807514 (accessed 28 September 2019).

Rossi, B. 2014. *Legal Issues Currently Affecting the Tech Sector*. From: https://www.information-age.com/legal-issues-currently-affecting-tech-sector-123458694/ (accessed 27 January 2019).

Nguyen, S. 2010. *Industrial & Organisational Psychology, Leadership, Teams, Training & Development: 6 steps to manage resistance to change*. From: https://workplacepsychology.net/2010/05/13/6-steps-to-manage-resistance-to-change/ (accessed 25 February 2019).

Oldewage, E.T., Engelbrecht, A.P. & Wesley, C.C. 2019. *The Importance of Component-Wise Stochasticity in Particle Swarm Optimization*. From: https://repository.up.ac.za/handle/2263/67359 (accessed 24 February 2019).

Parise, F., Lygeros, J. & Ruess, J. 2015. *Bayesian Inference for Stochastic Individual-Based Models of Ecological Systems: A pest control simulation study*. From: https://www.frontiersin.org/articles/10.3389/fenvs.2015.00042/full (accessed 24 Feb 2019).

Price, J.H. & Murnan, J. 2019. Research Limitations and the Necessity of Reporting Them. Libguides. *American Journal of Health Education* 35(2004):66-67. From: http://libguides.usc.edu/writingguide/limitations (accessed 01 April 2019).

Ray, L. 2019. Seven External Factors of Business. https://smallbusiness.chron.com/seven-external-factors-business-21960.html (accessed 01 April 2019).

Ross, S.M. 2019. *Legal Environment of Business*. From: https://michiganross.umich.edu/courses/legal-environment-business-9723 (accessed 23 February 2019).

Rossi, B. 2014. *Legal Issues Currently Affecting the Tech Sector*. From: https://www.information-age.com/legal-issues-currently-affecting-tech-sector-123458694/ (accessed 18 February 2019).

Ruiz, S.L.C. & Kovács, T. 2016. *Biometric Information Acquisition, Privacy Issues at the Workplace: Monitoring vs Security*. From:http://bgk.uni-obuda.hu/iesb/2016/publication/10.pdf (accessed 30 January 2019).

Rungta, A. 2016. *What is Technophobia and How to Overcome It?* From: https://www.indusnet.co.in/what-is-technophobia-and-how-to-overcome-it/ (accessed 24 February 2019).

Saeed, S. 2018. *What is Pragmatism? Is it a suitable worldview for mixed methods research design?* From: https://www.researchgate.net/post/whatis_pragmatism_Isit_a_suitable_worldview_for_mixed_methods_researchdesign (accessed 14 September 2019).

Sahab, S.A., Rose, R.C. & Osman, S.I.W. 2012. *Defining the Concepts of Technology and Technology Transfer: A literature analysis. Research Gate.* From: https://www.researchgate.net/publication/318015152_Defining_the_Concepts_of_Technology_and_Technology_Transfer_A_Literature_Analysis (accessed 16 June 2019).

Sahni, J., Levine, E. & Shinghal, S. 2019. *The Productivity Imperative for Healthcare Delivery in the United States.* From: https://www.mckinsey.com/~/media/McKinsey/Industries/Healthcare%20Systems%20and%20Services/Our%20Insights/The%20productivity%20imperative%20for%20healthcare%20delivery%20in%20the%20United%20States/The-productivity-imperative-for-healthcare-delivery-in-the-United-States.ashx (accessed 03 August 2019).

Salthouse, T.A. 2011. *All Data Collection and Analysis Methods Have Limitations.* From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3160711/ (accessed 01 April 2019).

Sanson-Fisher, R.W. 2014. *Diffusion of Innovation Theory for Clinical Change.* From: https://www.mja.com.au/journal/2004/180/6/diffusion-innovation-theory-clinical-change (accessed 26 February 2019).

Sarniak, R. 2015. *9 Types of Research Bias and How to Avoid Them.* From: https://www.quirks.com/articles/9-types-of-research-bias-and-how-to-avoid-them (accessed 31 July 2019).

Schulz, W. & Dankert, D. 2016. *Governance by Things' as a Challenge to Regulation by Law*. From: https://policyreview.info/articles/analysis/governance-things-challenge-regulation-law (accessed 05 February 2019).

Sebetci, Ö. 2019. *Enhancing End-User Satisfaction through Technology Compatibility: An assessment on health information system. Science Direct.* From: https://www.sciencedirect.com/science/article/pii/S2211883718301412#! (accessed 02 April 2019).

Sharrock, W. & Button, G. 2016. *In Support Of Conversation Analysis' Radical Agenda.* Sagepub. From: https://journals.sagepub.com/doi/full/10.1177/1461445616657955 (accessed 28 September 2019).

Sherman, F. 2018. *What are Internal & External Environmental Factors That Affect Business?* From: https://smallbusiness.chron.com/internal-external-environmental-factors-affect-business-69474.html (accessed 10 February 2019).

Shrivastava. S. 2019. *Karl Pearson's Coefficient of Skewedness.* From: https://www.youtube.com/watch?v=Ye10VS81KAM&t=4s (accessed 08 May 2019).

Shrourou, A. 2019. Researchers Identify Brain Pathways of Aversion. From: https://www.news-medical.net/news/20190214/Researchers-identify-brain-pathways-of-aversion.aspx (accessed 24 February 2019).

Shuttleworth, M. 2008. *Validity and Reliability*. From: https://explorable.com/validity-and-reliability (accessed 29 January 2019).

Silverman, B.G. & Lim, S. 2016. *Artificial Intelligence and Human Behavior Modeling and Simulation for Mental Health Conditions*. From: https://www.sciencedirect.com/science/article/pii/B9780124202481000076 (accessed 06 August 2019).

Simonds, V.W. & Rudd, R.E. 2019. *Public Health*. From: https://www.britannica.com/topic/public-health (accessed 02 April 2019).

Skoko, H., Ceric, A. & C. Huang C. 2008. Electronic Commerce Adoption Model of Chinese SMEs. *Journal of Business* Research 161-*16*5.

Small Business Development. 2019. These are the New Definitions for Micro, Small and Medium Enterprises in South Africa. *Business Stech.* From: https://businesstech.co.za/news/business/305592/these-are-the-new-definitions-for-micro-small-and-medium-enterprises-in-south-africa/ (accessed 31 July 2019).

Susan, B., Forte, A. & Bruckman, A. (2005). *Becoming Wikipedian: Transformation of participation in a collaborative online encyclopedia*, Proceedings of GROUP International Conference on Supporting Group Work, pp 1.-10. https://en.wikipedia.org/wiki/Legitimate_peripheral_participation, (accessed: 4th June 2018).

Moran, R. 2016. *Mainframe or Personal Computers*. From: http://www.roymoran.com/personal-computer-vs-main-frame/ (accessed 19 June 2018).

O'Kelly, A. 2016. *Gender Equality: Where do female entrepreneurs stand today*? From: https://www.huffingtonpost.com/allison-okelly/gender-equality-where-do-_b_12428910.html(accessed 18 August 2018).

Ocean, D. 2018. *What is the Difference between a Server and a Router?* From: https://www.quora.com/What-is-the-difference-between-a-server-and-a-router (accessed 19 June 2018).

Ochoa, C. 2017. *Random Sampling: Cluster Sampling*. From: https://www.netquest.com/blog/en/cluster-sampling (accessed 13 November 2018).

Ogrinja, G. 2013.*What are the Processes of a SCM*? From:https://www.seniorerp.ro/en/resurse_utile/what-are-the-processes-of-a-scm/ (accessed 28 October 2018).

Oracle. 2018. *Supply Chain Management: What is a Supply Chain Management System*? From: https://www.oracle.com/za/applications/supply-chain-management/what-is-supply-chain-management-system.html (accessed 28 October 2018).

Palinkas, L.A., Horwitz, S.M., Green, C.A.., Wisdom, J.P., Duan, N. & Hoagwood, K. 2016. Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4012002/ (accessed 13 November 2018).

Pallant, J.2013. *SPSS Survival Manual*. United Kingdom: McGraw-Hill Education.

Parise, F., Lygeros, J. & Ruess, J. 2018. *Bayesian Inference for Stochastic Individual-Based Models of Ecological Systems: A pest control simulation study. Frontiersin*. From: https://www.frontiersin.org/articles/10.3389/fenvs.2015.00042/full (accessed 12 June 2019).

Park, S.Y. & Yun, G.W. 2017. *The Impact of Internet-Based Communication Systems on Supply Chain Management: An application of transaction cost analysis.* From: https://academic.oup.com/jcmc/article/10/1/JCMC1013/4614507 (accessed 12 May 2018).

Pashaei, S. & Olhager, J. 2015. Product Architecture and Supply Chain Design: A systematic review and research agenda, *Supply Chain Management: An International Journal*, 20(1):98 – 112.

Paulo, S. 2014.*Complexity and Information Technologies: An ethical inquiry into human autonomous action*. From: http://www.scielo.br/scielo.php?script=sciarttext&pid=S1678-31662014000500009 (accessed 4 August 2018).

Penaluna, K., Penaluna, A., Usei, C. & Griffiths, D. 2015. Enterprise Education Needs Enterprising Educators: A case study on teacher training provision. *Journal of Education & Training* 57(8/9):948-963.

Pereira, G.M., Sellitto, M.A. & Borchardt, M. 2018. *Flexibility and Orientation for Two Supply Chains Fashion Industry Markets: Analysis and model for future research.* From: http://www.scielo.br/scielo.php?pid=S0104530X2018000200319&script=sci_arttext&tlng=en (accessed 4 August 2018).

Picks, B. 2018. *The Best VPN Services and Apps of 2018.* From:https://www.tomsguide.com/us/best-vpn,review-4292.html (accessed 20 May 2018).

Pilon, A. 2017. 20 *Successful Entrepreneurs with No Experience.* From: https://smallbiztrends.com/2016/03/successful-entrepreneurs-with-no-experience.html (accessed 17 August 2018).

Pinho, J.C. & Sampaio de Sá, E. 2014. Personal Characteristics, Business Relationships and Entrepreneurial Performance: Some empirical evidence. *Journal of Small Business and Enterprise Development.* (21)2:284-300. From: https://doi.org/10.1108/JSBED-10-2013-0150. (accessed 08 July 2020).

Poba-Nzaou, P., Raymond, L. & Fabi, B. 2014. Risk of Adopting Mission-Critical OSS Applications: An interpretive case study. *International Journal of Operations & Production Management* 34(4):477-512.

Poirier, G. 2018. *Advantages of Fax Transmissions.* From: http://smallbusiness.chron.com/advantages-fax-transmissions-29710.html (accessed 4 June 2018).

Porteous, E. 2014. 5 *How to Improve the Perception of Procurement.* From: http://www.smartprocurement.co.za/archives/5_hows_to_improve_the_perception_of_procurement.php#sthash.JWzXViXY.dpbs (accessed 4 June 2018).

Portugal, L. 2016. *Information Management: Information systems and technologies management, master.* From: https://www.mastersportal.com/studies/43376/information-management-information-systems-and-technologies-management.html (accessed 24 May 2018).

Post, J. 2017. What Traits Do the Most Successful Entrepreneurs Have in Common? From: https://www.businessnewsdaily.com/8128-traits-of-successful-entrepreneurs.html (accessed 9 May 2018).

Power, D. 2008a. *What are Challenges of Real-Time Decision Support?* From: http://dssresources.com/faq/index.php?action=artikel&id=178 (accessed 10 May 2018).

Power, D. 2008b. *Executive Information Systems Revisited*. From: http://www.b-eye-network.com/view/10498 (accessed 10 May 2018).

Pradhan, S.K. 2013. *IT Architecture Design Framework: ADMIT*. From: https:// www.infoq.com/articles/admit-architecture-framework (accessed 19 December 2018).

Prasanna, R., Yang, L., King, M. & Huggins, T.J. 2017. Information Systems Architecture for Fire Emergency Response. *Journal of Enterprise Information Management* 30(4).

Priyankara, D. 2015. *Types of Database End Users.* From: http://dinesql.blogspot.com/ 2015/10/types-of-database-ECs.html (accessed 3 June 2018).

Quintia, L. 2015. *Legal and Ethical Issues in Information Technology*. From: https://prezi.com/7g6gxh7aea1i/legal-and-ethical-issues-in-information-technology/ (accessed 19 February 2019).

Ramsey, E. & McCole, P. 2013. *E-business in Professional SMEs:* The case of New Zealand. *Journal of Small Business and Enterprise Development.*

Rana, G., Goel, A.K. & Rastogi, R. 2013. Talent Management: A paradigm shift in Indian public sector*. Journal of Strategic HR Review* 12(4):197-202.

Rees, W.D. & Porter, C. 2015. Delegation: A crucial but sadly neglected management skill. *Journal of industrial and commercial training* 47(6):320–325.

Regalado, A. 2018. *The Biggest Technology Failures of 2017.* From: https://www.technologyreview.com/s/609626/the-biggest-technology-failures-of-2017/ (accessed 4 August 2018).

Repplinger, J. 2015. *Primary, Secondary, & Tertiary Sources.* From: https://libguides.willamette.edu/primary-sources (accessed June 2018).

Reynolds, A. 2018. *The Uses of Mainframe Computers*. From: https://www.techwalla.com/articles/why-does-my-hard-drive-run-all-the-time (accessed 20 May 2018).

Richards, L. 2018.*What Types of Information Resources Does a Business Usually Need?* From: http://smallbusiness.chron.com/types-information-resources-business-usually-need-4753.html (accessed 5 June 2018).

Riezebos, R. 2017. 09 Living Brands: The characteristics of living brand companies. *Branding Inside Out: Internal Branding in Theory and Practice, p.133.*

Robbins, S.P. & Coulter, M. 2014. *Management Global,* 12th edition. Kendallville: Pearson Publishers.

Robbins, S.P. & DeCenzo, D.A. 2014. *Fundamentals of Management: Essential concepts and applications,* 6th edition. New Jersey: Pearson Publishers.

Robinson, A. 2015. *[INFOGRAPHIC] The Evolution and History of Supply Chain Management*. From: https://cerasis.com/2015/01/23/history-of-supply-chain-management/ (accessed 6 November 2018).

Roger, E.K. 2015. *Random Sample*. From: https//doi.org/10.1002/9781405165518.wbeosr018.pub2 (accessed 11 June 2019).

Rohit. 2017. 10 Best Android Emulators for Windows 10 PC & Laptop in 2018 | Windows 7/8.1 [Download Links]. From: http://www.technorange.com/2017/06/10-best-android-emulators-for-windows-10-pc-laptop-in-2017-windows-7-8-1-download-links/ (accessed 20 May 2018).

Rojon, C. & Saunders, M.N.K. 2012. Formulating a Convincing Rationale for a Research Study, *Coaching: An International Journal of Theory, Research and Practice*, 5 (1). pp. 55-61.

Roland, K., Yeo, J., Gold, M. & Marquardt, J. 2015. Becoming Leaderful: Leading forward in turbulent times. *Journal of Industrial and Commercial Training* 47(6): 285-292.

Ronny, 2017. *Biggest Technological Failures of 2017.* From: http://techconnectmagazine.com/biggest-technological-failures-2017/ (accessed 4 August 2018).

Root III, G.N. 2018. *The Advantages of a Business Using Email.* From: http://smallbusiness.chron.com/advantages-business-using-email-4010.html (accessed 10 May 2018).

Ross, S. 2018a. *How does Enterprise Resource Planning (ERP) Assist in Human Resources Planning?* From: https://www.investopedia.com/ask/answers/021115/how-does-enterprise-resource-planning-erp-assist-human-resources-planning.asp (accessed 16 May 2018).

Ross, S. 2018b. *What are the Advantages and Disadvantages of Using Systematic Sampling*? From:https://www.investopedia.com/ask/answers/042415/what-are-advantages-and-disadvantages-using-systematic-sampling.asp (accessed 14 November 2018).

Rouse, M. 2018a. *Hardware.* From: https://searchnetworking.techtarget.com/definition/hardware (accessed 19 June 2018).

Rouse, M. 2018b. *Decision Support System (DSS).* From: https://searchcio.techtarget.com/definition/decision-support-system (accessed 19 June 2018)

Rouse, M. 2018c. *Local Area Network (LAN).* From: https://searchnetworking.techtarget.com/definition/local-area-network-LAN (accessed 19 June 2018).

Rubin, A. & Babbie, E. 2013*. Brooks/Cole Empowerment Series: Research methods for social work,* 8th edition. Texas: Cengage Learning.

Rundell. S.D., Kumar, A. & Thorpe, D. 2017. *Current Pilot Studies: Developing a prognostic model for risk adjustment in patients with back pain.* From: http://www.bu.edu/cohstar/research/current-pilot-studies/ (accessed 19 November 2018).

Rupeika-Apoga, R. & Danovi, A. 2015. *Availability of Alternative Financial Resources for SMEs as a Critical Part of the Entrepreneurial Eco-System: Latvia and Italy*. From: Https://Www.Sciencedirect.Com/Science/Article/Pii/S2212567115017050 (accessed 19 June 2018).

Rycroft, R.W. & Kash, D.E. 1999. *Innovation Policy for Complex Technologies.* From: http://issues.org/16-1/rycroft/(accessed 4 August 2018).

Saha, V. 2018. *The Ultimate Guide to Supply Chain Management.* From: https://www.camcode.com/asset-tags/supply-chain-management-guide/ (accessed 28 October 2018).

Said, R., Omar, N. & Abdullah, W.N. 2013. Empirical Investigations on Boards, Business Characteristics, Human Capital and Environmental Reporting*. Journal of Social Responsibility* 9(4):534-553.

Saito, G., Sakurazawa, H. & Nakamura, T. 2017. *Development of New Enterprise Applications to Achieve Financial Innovation*. From:http://www.hitachi.com/rev/archive/2017/r2017_01/112/index.html?WT.mc_id=ksearch_104 (accessed 12 November 2018).

Salkind, N.J. 2010. *Pilot Study: Encyclopedia of Research Design.* From: http://methods.sagepub.com/reference/encyc-of-research-design/n312.xml (accessed 14 November 2018).

Sambartolo, M. 2015. Keys to Optimising Workforce Resources across the Enterprise. *Journal of Strategic HR Review* Vol. 14.

Samuel, B.G. & Neil, J.S. 2016.*Using SPSS for Windows and Macintosh,* 8th edition. Books a la Carte.

Sanders, M., Zeng, G., Hellicar, M. & Fagg, K. 2016. *The Power of Flexibility: A key enabler to boost gender parity and employee engagement.* From: https://www.bain.com/insights/the-power-of-flexibility/ (accessed 4 August 2018).

Sanghani, R. 2014. *How Did a Work Experience Girl Make a Major Cystic Fibrosis Breakthrough?* From: https://www.telegraph.co.uk/women/womens-health/10937687/Work-experience-How-did-a-work-experience-girl-make-a-major-cystic-fibrosis-breakthrough.html (accessed 21 August 2018).

Sarri, K.K., Bakouros, I.L. & Petridou, E. 2010. Entrepreneur Training for Creativity and Innovation. *Journal of European Industrial Training* (34)3:270-288. From: https://doi.org/10.1108/03090591011031755 (accessed 08 July 2020).

Saunders, M, Lewis, P. & Thornhil, A. 2012. *Research Methods for Business Students,* 6th edition. Italy: Library of Congress Cataloguing-in-Publication Data.

Saunders, M., Lewis, P. & Thornhill, A. 2012. *Research Methods for Business Students*. Harlow, England: Pearson.

Sawers, P. 2012. *Hardwired Humans: Why our aversion to technological advances is about to change*. From: https://thenextweb.com/socialmedia/2012/07/08/hardwired-humans-why-our-aversion-to-technological-advances-is-about-to-change/ (accessed 24 February 2019).

Schiller, B.R. 2008b. *The Economy Today,* 11th edition. New York: McGraw-Hill Irwin.

Schnädelbach, H. 2010. *Adaptive Architecture - A Conceptual Framework*. From: https://www.quora.com/What-is-a-conceptual-framework-in-the-field-of-architecture (accessed 6 November 2018).

Schofield, J. 2018. *Do I Still Need PC Tuning Software for Windows 10?* From: https://www.theguardian.com/technology/askjack/2018/jan/11/pc-tuning-software-windows-10-clean-up (accessed: 20 May 2018).

Schwab, K. 2016. The Fourth Industrial Revolution: What it means, how to respond. *World Economic Forum.* From: https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ (accessed 08 April 2019).

Sedgwick, P. 2013. *Proportional Quota Sampling*. From: https://www.bmj.com/content/345/bmj.e6336 (accessed 13 November 2018).

Segal, 2018. *Information Technology (IT).* From: https://www.investopedia.com/ask/answers/040315/what-difference-between-mis-management-information-system-and-information-technology.asp (accessed, 24 May 2018).

Sekaran, U. & Bougie, R. 2009. *Research Methods for Business.* John Wiley & Sons Ltd: Great Britain. Source: Boundless. "Characteristics of business-customer interactions." boundless marketing boundless". From: https://www.boundless.com/marketing/textbooks/boundless-marketing-textbook/business-to-business-marketing-5/business-customers-45/characteristics-of-business-customer-interactions-223-6622/ (accessed 8 September 2019).

Seth, S. 2017a. *10 Characteristics of Successful Entrepreneurs*. From: https://www.inve stopedia.com/articles/personal-finance/101014/10-characteristics-successful-entre preneurs.asp (accessed 9 May 2018).

Seth, S. 2017b. *Why Entrepreneurs? Are Important for the Economy?* From: https://www.investopedia.com/articles/personal-finance/101414/why-entrepreneurs-are-important-economy.asp (accessed 20 August 2018).

Sewdass, N. 2012. Proposing a Competitive Intelligence (CI) Framework for Public Service Departments to Enhance Service Delivery*. South African Journal of Information Management* 14(1) pp.1-13.

Shamsuzzoha, A.H.M. & Helo, P.T. 2012: *Development of Modular Product Architecture through Information Management,* VINE. 42(2):172–190.

Sharma, P. 2018a. *6 Main Components of Decision Support System (DSS).* From: http://www.yourarticlelibrary.com/management/decision-making-management/6-main-components-of-decision-support-system-dss/70302 (accessed 3/25/2018).

Sharma, S. 2015b.*Supply Chain Management*. India: Oxford University Press.

Shefer, D. 2018. *Desktop vs. Enterprise Applications: The Impact on Product Management*. From:https://www.pragmaticmarketing.com/resources/articles/desktop-vs-enterprise-applications-the-impact-on-product-management (accessed 12 November 2018).

Shelat, M. 2016. *Node.js for Enterprise Applications! Are You Kidding*? From: https://dzone.com/articles/nodejs-for-enterprise-applications-are-you-kidding (accessed 12 November 2018).

Shelly, G.B. & Vermaat, M.E. 2011. *Discovering Computers Complete: Living in a digital world, course technology Cengage Learning*. United States of America, Boston.

Sherman, F. 2018.Why is It Important to Combine Functions in Business? From: *http://smallbusiness.chron.com/important-combine-functions-business-39866.html,* (accessed: 12 May 2018).

Shilman, D. 2017. *Solution Architecture vs. Software Architecture*. From: https://dzone.com/articles/solution-architecture-vs-software-architecture (accessed: 12 November 2018).

Shuttleworth, M. 2010. *Pilot Study*. From: https://explorable.com/pilot-study (accessed 14 November 2018).

Shuttleworth, M. 2015. *Internal Consistency Reliability.* From: https:// explorable.com/ internal-consistency-reliability (accessed 01 September 2019).

Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. 2009. *Designing and Managing the Supply Chain: Concepts, strategies and case studies,* 3rdedition. New York: McGraw Hill International.

Singh, J. 2018. Factors of Production: Land, labour, capital and entrepreneur/national income. From: http://www.economicsdiscussion.net/production/factors-of-production-land-labour-capital-and-entrepreneur-national-income/541 (accessed: 28 April 2018).

Sinha, S., Zande, J.V. & Smith, G. 2015. *Exceed Revenue Goals and Deliver Personalised Buyer Engagements*. From: https://www.sap.com/africa/products/crm-commerce/sales.html (accessed 5 November 2018).

Sjögrén, H., Flainen, K. & Syrjä, P. 2011. What Does the Owner-Manager Want and Get Out of the Business? *International Journal of Law and Management* 53(5)355-374.

Small Enterprise Development Agency. 2018a. *SMME Quarterly Update: 1st Quarter 2018*. From: http://www.seda.org.za/Publications/Publications/SMME%20Quarterly%202018-Q1.pdf (accessed 19 November 2018).

Small Enterprise Development Agency. 2019b. *SEDA-eServices Portal*. From: http://www.seda.org.za/ (accessed 23 February 2019).

Small Enterprise Development Agency 2019. SMME Quarterly Update: 1st Quarter. From: www.seda.org.za (accessed 09 July 2020).

Smallwood. 2014. *Defining the Differences between Information Governance, IT Governance, & Data Governance.* From: http://community.aiim.org/blogs/robert-smallwood/2014/08/18/defining-the-differences-between-information-governance-it-governance--data-governance (accessed 04June 2018).

Smit. W. 2017. *SMMEs Contribute 36% to Economy*. From: https://www.iol.co.za/business-report/opinion/smmes-contribute-36-to-economy-8269623(accessed 29 July 2019).

Smith, C. 2013.*What is a Knowledge Management System?*From: http://www.dzone software.com/blog/what-is-knowledge-management (accessed 28 May 2015).

Smith, T. & Barrett, R. 2016. Online Learning: An effective means for developing small business owner-managers' capabilities? *Journal of Small Business and Enterprise Development* 23(1):207-223.

Somerville, M. 2018. *Lack of Managerial Skill Causes Problems for Staff*. From: https://smallbusiness.co.uk/lack-of-managerial-skill-causes-problems-for-staff-331801/ (accessed 27 January 2019).

Spacey, J. 2015. *10 Types of Business Constraint: Simplicable.* From: https://simplicable.com/new/business-constraints (accessed 10 June 2019).

Stephani. 2014. *Statistics How to Statistics for the Rest of Us: Modal Instance Sampling*. From: https://www.statisticshowto.datasciencecentral.com/modal-instance-sampling/ (accessed 20 November 2019).

Sternad, S. & Bobek, S. 2013. Impact of TAM-Based External Factors on ERP Acceptance: Conference on enterprise information systems/ProjMAN 2013. International Conference on health and social care information systems and technologies. Report. Maribor: Slovenia: (RP34-42/2013).

Stet, M. 2014. *Benefits and Drawbacks of Technology in Supply Chain Management*. From: https://ideas.repec.org/a/cmj/seapas/y2014i5p617-622.html (accessed 25 February 2019).

Strom, E. 2017. *What is the Most Used Mobile Biometric?* From: https://www.asmag.com/showpost/27304.aspx (accessed 18 January 2018).

Suhadak, R.O. & Mawardi, K.M. 2017. *Analysis of the Influence of External and Internal Environmental Factors on Business Performance: A study on micro small and medium enterprises (MSMEs) of food and beverage*. From: https://www.researchgate.net/publication/318214243_analysis_of_the_influence_of_external_and_internal_environmental_factors_on_business_performance_a_study_on_micro_small_and_medium_enterprises_msmes_of_food_and_beverage (accessed 27 January 2019).

Sun, H. 2011. The 3-3-3 Framework and 7P Model for Teaching Creativity, Innovation and Entrepreneurship. *Journal of Chinese Entrepreneurship*. (3)2:159-166. From: https:// doi.org/10.1108/17561391111144582 (accessed 08 July 2020).

Sun, H. 2011. The 3-3-3 Framework and 7P Model for Teaching Creativity, Innovation and Entrepreneurship. *Journal of Chinese Entrepreneurship* 3(2):159-166.

Surbhi, S. 2016. *Difference between T-test and ANOVA*. From: https://keydifferences.com/difference-between-t-test-and-anova.html (accessed 19 June 2018).

Susman, S. 2017. *Why SMEs Have the Potential to Transform the Economy?* From: https://www.fin24.com/Companies/Retail/why-smes-have-the-potential-to-transform-the-economy-20171030 (accessed 29 July 2019).

Svärd, P. 2013. Enterprise Content Management and the Records Continuum Model as Strategies for Long-Term Preservation of Digital Information*. Records Management Journal* 23(3):159-176.

Sweeney, M. 2011. *Relative Advantage of Technology Use in the Classroom*. From: https://melodeesweeney.wordpress.com/2011/04/16/relative-advantage-of-technology-use-in-the-classroom/ (accessed 18 February 2019).

Székely, T. & Burrage, K. 2014. *Stochastic Simulation in Systems Biology*. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262058/ (accessed 24 Feb 2019).

Szigligetius, G. 2019. *Nonlinear Dynamics and Stochasticity: A piece on meromorphic anstochasticity.* From: https://www.academia.edu/Documents/in/Nonlinear_Dynamics_and_Stochasticity (Accessed 24 February 2019).

Tagged, H.B. 2019. *What is Relative Advantage? Concept, Advantage and Application. Marketing G91.* From: https://www.marketing91.com/relative-advantage/ (accessed 10 June 2019).

Tamrin, S.I., Norman, A.A. & Hamid, S. 2017. Information Systems Security Practices in Social Software Applications: A systematic literature review, Aslib. *Journal of Information Management* 69(2):131-157.

Tamrin, S.I., Norman, A.A. & Hamid, S. 2017. Information Systems Security Practices in Social Software Applications: A systematic literature review. *Aslib Journal of Information Management* 69(2): 131-157.

Tani, G. & Gimatti, B. 2009. *Technological Complexity: A support to management decisions for product engineering and manufacturing*. From: https://www.researchgate.net/publication/224366847_Technological_complexity_A_support_to_management_decisions_for_product_engineering_and_manufacturing (accessed 4 August 2018).

Tavakol, M. & Dennick, R. 2014. *Data Science Central. Cronbach's Alpha: Simple definition, use and interpretation*. From: https://www.statisticshowto.datasciencecentral.com/cronbachs-alpha-spss/ (accessed 31 July 2019).

Taylor, M., Higgins, E. & Lisboa, P. 2012. Testing Geographical Information Systems: A case study in a fire prevention support system. *Journal of Systems and Information Technology* 14(3):184-199.

Technopedi. 2018. *Biometrics*. From: https://www.techopedia.com/definition/10239/biometrics (accessed 2 December 2018).

Thakur, D. 2018. *Personal Computer - What is personal computer (PC)?* From: http://ecomputernotes.com/fundamental/introduction-to-computer/personal-computer (accessed 20 May 2018).

Thulo, L. 2019. This African Online Marketplace Delivers Uniquely African Products to the World. From: http://sme.adclickmobile.com (accessed 09 July 2020).

Thomas, J. 2011. *Search for Solutions: Manage engine*. From: https://www.manageengine.com/products/service-desk/help/userguide/solutions/self-service-search-solution.html (accessed 10 June 2019).

Thompson, K. 2015a. *Positivism and Interpretivism in Social Research*. From: https://revisesociology.com/2015/05/18/positivism-interpretivism-sociology/ (accessed 28 January 2018).

Thompson, V. 2018b. *Should Entrepreneurs Have a Risk-Taking Spirit*? From: https://yourbusiness.azcentral.com/should-entrepreneurs-risktaking-spirit-9352.html/ (accessed 21/03/2018).

Thorne, S. 2016. *Interpretive Description: Qualitative research for applied Practice,* 2nd edition. From: https://doi.org/10.4324/9781315545196. New York: Imprint Routledge (accessed 15 June 2019).

Thurik, R. 2018. *Entrepreneurship and the Business Cycle.* From: https://wol.iza.org/articles/entrepreneurship-and-the-business-cycle/long (accessed 20 Aug 2018).

Ticlo*,* I. 2018. *4 Ways to Achieve Operational Efficiency across Your Supply Chain.* From: https://www.insight.com/en_US/learn/content/2018/02072018-4-ways-to-achieve-operational-efficiency-across-your-supply-chain.html (accessed 12 May 2018).

Tolstoshev, N. 2017. *Guide for Writing Functional Competencies.* From: https://community.spiceworks.com/how_to/40913-assess-EC-competency-level/ (accessed 3/10/2017).

Tong, K. 2019. *EHR Compatibility and Connectivity: Two obstacles to patient care. Ehrintelligence.* From:https://ehrintelligence.com/news/ehr-compatibility-and-connectivity-two-obstacles-to-patient-care (accessed 02 April 2019).

Toor, T. 2016. Designing Future Enterprises: Aligning enterprise design with business strategy. *Journal of Strategic Direction* 32(10): 33-34.

Tourish, D. 2020. Leadership for the Greater Good: Reflections on Today's Challenges From Around the Globe: The Coronavirus Crisis and Leadership in Business. From: https://theila.org/the-coronavirus-crisis-and-leadership-in-business/?gclid=CjwKCAiAxp-ABhALEiwAXm6IyYIIDTRDNpee91KZKktQmyDij9__sFZO1dldlWC50alrRNkPgS657xoCyDAQAvD_BwE (accessed 20 January 2021

Travis, D. 2017. *The 8 Competencies of User Experience: A tool for assessing and developing UX Practitioners*. From: https://www.userfocus.co.uk/articles/8-competencies-of-user-experience.html (accessed 4th June 2018).

Trigo, A. & Belfo, F. 2013.*Accounting Information Systems: Tradition and future directions*. From: https://www.researchgate.net/publication/259638678_Accounting_Information_Systems_Tradition_and_Future_Directions/figures?lo=1 (accessed 12 November 2018).

Trinh-Phuong, T., Molla, A. & Peszynski, K.J. 2012. *Enterprise Systems and Organisational Agility: A review of the literature and conceptual framework, semantic scholar, enterprise systems and organisational agility:* From:http://www.pacis-net.org/file/2012/PACIS2012-166.pdf (accessed 21 July 2019).

Truong, H.L. & Dustdar, S. 2012. A Survey on Cloud-Based Sustainability Governance Systems. *International Journal of Web Information Systems* 8(3):278-295.

Tumenta, D. 2016. *Top 20 Powerful Traits of Most Successful Entrepreneurs.* From: https://www.backlinkfy.com/news/top-20-powerful-traits-of-most-successful-entrepreneurs (accessed: 9 May 2018*).*

Usoro, A., Shoyelu, S. & Kuofie, M. 2010. Task-Technology Fit and Technology Acceptance Models Applicability to e-tourism. *Journal of Economic Development Management IT Finance and Marketing*, pp. 1-32

Vaesen, K. & Houkes, W. 2017. Biology and Philosophy: Complexity and technological evolution. From: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5842246/ (accessed 16 June 2019).

Vaiman, V., Scullion, H. & Collings, D. 2012. Talent Management Decision Making. *Journal of Management Decision* 50(5):925-941.

Van Aardt, I., Barros, M., Clarence, W., Van Rensburg, L.J., Radipere, S., Rankhumise, E.M., Venter, E. & Visser, D.J. 2016. *Principles of Entrepreneurship and Small Business Management.* Southern Africa: Oxford University Press.

Van der Meulen, R. 2018. From: https://www.gartner.com/smarterwithgartner/build-a-modern-supply-chain-workforce/ (accessed 28 October 2018).

Van Druten, J. 2019. *Data, Sampling, and Variation in Data and Sampling.* Open stax. From: https://cnx.org/contents/2W5NXrTD@1/Data-Sampling-and-Variation-in-Data-and-Sampling (accessed 03 August 2019).

Vasilaki, E. & Allwood, D.A. 2018. *Details of Grant*. From: https://gow.epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/S009647/1 (accessed 24 February 2019).

Vatsa. A.K. 2010. *Basics of Data Communication Part 1*. From: https://www.c-sharpcorner.com/uploadfile/abhikumarvatsa/basics-of-data-communication-part-1/ (accessed 5 August 2018).

Vejlgaard, H. 2018. *Culture as a Determinant in Innovation Diffusion. Intechopen.* From: https://www.intechopen.com/books/the-future-of-television-convergence-of-content-and-technology/culture-as-a-determinant-in-innovation-diffusion (accessed 12 April 2019).

Verial, D. 2018. *Advantages and Disadvantages of Multi-Stage Sampling.* From: https://classroom.synonym.com/advantages-disadvantages-multistage-sampling-8544049.html (accessed 14 November 2018).

Vetráková, M., Smerek, L. & Seková, M. 2017. *The Importance of Human Resources Management in Business Practice in Slovakia*. From: http://ibima.org/accepted-paper/importance-human-resources-management-business-practice-slovakia/ (accessed 20 May 2018).

Viets, A. 2014. *7 New Competencies for a Competent HR Department.* From: http://playbook.amanet.org/international-hr-for-everyone/ (accessed 20 May 2018).

Vikas, M., Khan, M.I. & Sultanpur, K.N.I.T. 2010. SCM Systems: Architecture, design and vision. *Journal of Strategic Innovation and Sustainability* 6 4:102-108.

Vodafone. 2019. *Working with Vodafone.* From: https://www.vodafone.com/content/index/about/suppliers.html# (accessed 20 February 2019).

Vogt, V. 2015. *How Technology is Going to Impact on Deep Level Mining in SA.* From: https://www.moneyweb.co.za/news-fast-news/how-technology-is-going-to-impact-on-deep-level-mining-in-sa/(accessed 4 August 2018).

Vogt, W.P., Gardner, D.C. & Haeffele, L.M. 2012. *When to Use What Research Design.* New York: The Guilford Press.

Vogt, P. 2017. *Business Logistics Management*. Cape Town: Oxford University Press.

Vuba, S. 2019. *The Missed Opportunity: SMMEs in the South/ African economy*. From: https://mg.co.za/article/2019-04-12-00-the-missed-opportunity-smmes-in-the-south-african-economy (accessed 29 July 2019).

Wade, H. 2018. *Disadvantages to Biometric Identification Systems*. From: https://www.techwalla.com/articles/disadvantages-to-biometric-identification-systems (accessed 5 August 2018).

Walcerz, M. 2018. *Legal and Ethical Issues in Technology.* From: https://legalbeagle.com/7640133-legal-ethical-issues-technology.html (accessed 19 February 2019).

Walport, M. & Rothwell, D.N. 2013. *Council for Science and Technology.* From: *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/224953/13-923-age-of-algorithms-letter-to-prime-minister__1_.pdf* (accessed 16 June 2019).

Weber, P., Geneste, L.A. & Connell, J. 2015. Small Business Growth: Strategic goals and owner preparedness. *Journal of Business Strategy* (36)3:30-36. From: https://doi.org/10.1108/JBS-03-2014-0036 (accessed 07 July 2020).

Sangam, V. 2010. Supply Chain World: Supply chain optimization. From: https://vijaysangamworld.wordpress.com/2010/10/21/supply-chain-insourcing-vs-outsourcing/ (accessed 16 June 2019).

Walsh, D. & House, C. 2019. *Rescue Your Java Script with Javascript Error Tracking*. From: https://trackjs.com/ (accessed 25 February 2019).

Trinh-Phuong, T., Molla, A. & Peszynski, K.J. 2012. Enterprise Systems and Organizational Agility: A Review of the Literature and Conceptual Framework. *Semantic Scholar.* (accessed 21 July 2019).

Trinh-Phuong, K.S. 2018. *Journal of Entrepreneurship & Organisation Management*. From: https://www.omicsonline.org/open-access/the-impact-of-customer-relationship-

management-on-Organisation-profit-of-in-somali-2169-026X-1000221-101362.html (accessed 5 November 2018).

Watson, H.J. & RainerJr, R.K. 1991. *A Manager's Guide to Executive Support Systems*. From: https://www.sciencedirect.com/science/article/pii/0007681391900654(accessed 24 May 2018).

Wayner, P. 2019. *The Top 5 Software Architecture Patterns: How to make the right choice*. From: https://techbeacon.com/app-dev-testing/top-5-software-architecture-patterns-how-make-right-choice (accessed 06 February 2019).

Weber, P., Geneste, L.A. & Connell, J. 2015. Small Business Growth: Strategic goals and owner preparedness. *Journal of Business Strategy* 36(3):pp.30-36.

Webster, M. 2019. *Examples of Stochastic in a Sentence.* From: https://www.merriam-webster.com/dictionary/stochastic (accessed 12 June 2019).

Wegner, T. 2015. *Applied Business Statistics: Methods and excel-based applications*, 4th edition. Cape Town: Juta and Company.

Wempen, F. 2018. 5 Types of *Personal* Computers. From:http://www.dummies.com/computers/5-types-of-personal-computers/ (accessed 20 May 2018).

Whittaker, R.H. (Ed.). 2012. *Ordination of Plant Communities.* 5(2). Springer Science & Business Media.

Wiid, J. & Diggines, C. 2009. *Marketing Research*. Cape Town: Juta & Co. Ltd.

Wiredu, G.O. 2012. Information Systems Innovation in Public Organisations: An institutional perspective. *Journal of Information Technology & People* 25 (2): 188-206.

Wisner, J.D., Tan, K.C. & Leong, G.K. 2012. *Supply Chain Management: A Balanced Approach*. Canada: South-Western Cengage Learning.

Wisniewski, M. 2009, *Quantitative Methods for Decision Makers,* 5th Edition. United Kingdom: Library of Congress Cataloguing-in-Publication Data, London.

Wittrock, C. & Heiden, M.K. 2020. Asset Management—What is it? Definition and development. From: https://www.bankinghub.eu/themen/asset-management (accessed 08 February 2021).

Writing, A. 2017. *Processes in Supply Chain Management*. From: https://bizfluent.com/info-8197960-processes-supply-chain-management.html (accessed 28 October 2018).

Yasuhiro, A., Takatoshi, T. & Kazuhiro, Y. 2012. *Market Size and Entrepreneurship: The research institute of economy, trade and industry.* From: http://www.rieti.go.jp/en/ (accessed 20 August 2018).

Zandbergen, J. 2018a. *What is Computer Hardware? Components, definition & examples.* From:https://study.com/academy/lesson/what-is-computer-hardware-components-definition-examples.html (accessed 20 May 2018).

Zandbergen, P. 2018b. *Executive Information Systems (EIS): Upper management decision-making tools.* From: https://study.com/academy/lesson/executive-information-systems-eis-upper-management-decision-making-tools.html (accessed 24 May 2018).

Zaugg, H. & Warr, M.C. 2018. Integrating a Creativity, Innovation and Design Studio within an Academic Library. *Journal of Library Management* 39(3/4):172-187.

Zentis, N. 2020. 10 Reasons for Using the Action Research Model for Successful OD Interventions. From: www.instituded.com (accessed 02 July 2020).

Zayra, V. 2016. *Men with 2 Years of Work Experience Earn More Than Women with 6.* From: http://fortune.com/2016/09/13/ivy-league-wage-gap/(accessed 21 August 2018).

Zhang, R., Brennan, T.J. & Lo, A.W. 2014. *The Origin of Risk Aversion*. From: https://www.ncbi.nlm.nih.gov/pubmed/25453072 (accessed 24 February 2019).

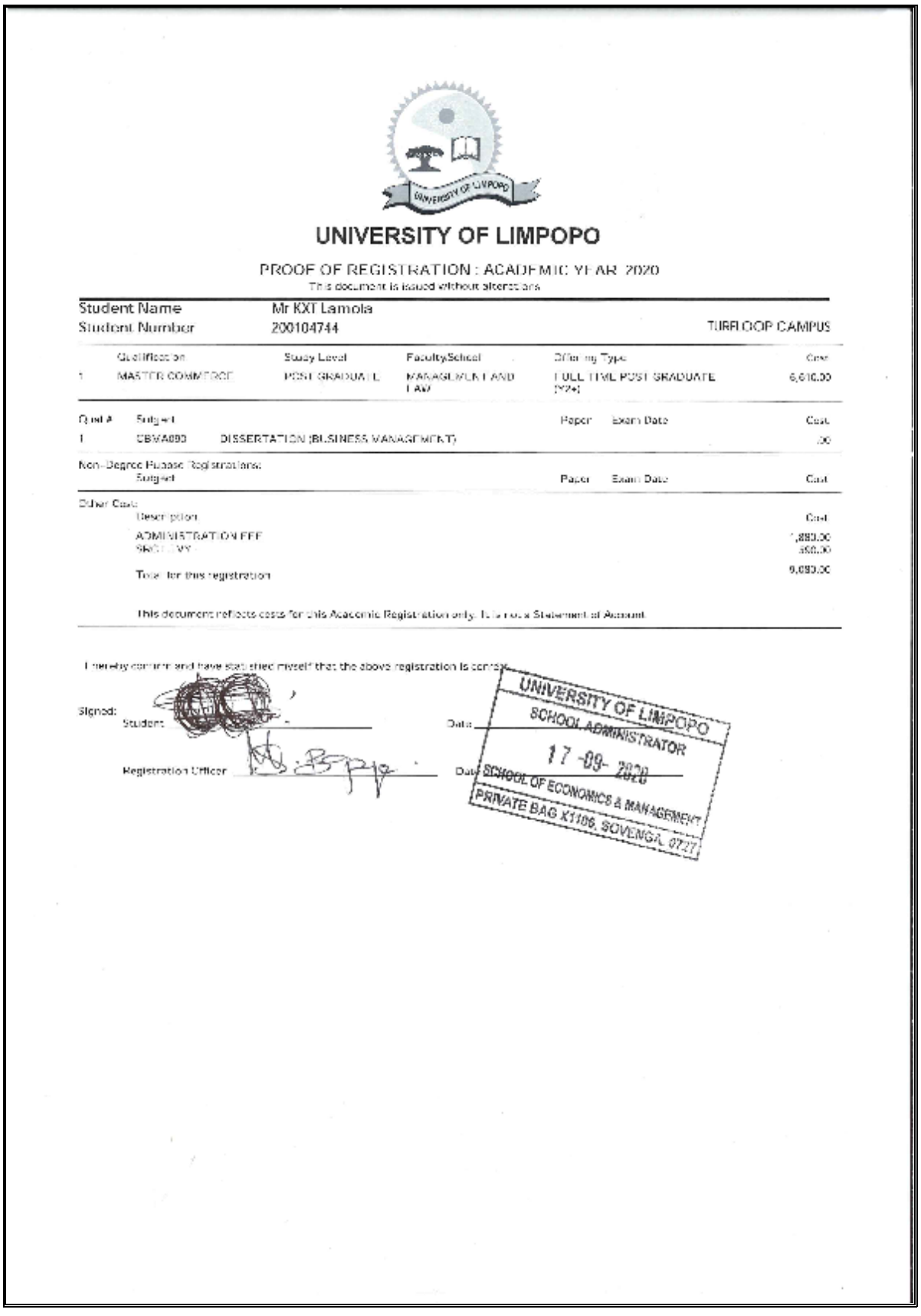
Zhou, J. & Ning, D. 2017. *Microbiology and Molecular Biology Review: Stochastic community assembly: Does It Matter in Microbial Ecology?* From:https://mmbr.asm.org/content/81/4/e00002-17 (accessed 24 February 2019).

Zide, J.S., Mills, M.J., Shahani-Denning, C. & Sweetapple, C. 2017. Work Interruptions Resiliency toward an Improved Understanding of Employee Efficiency. *Journal of Enterprisesal Effectiveness, People and Performance* (4)1:39-58.

Zide, J.S., Mills, M.J., Shahani-Denning, C. & Sweetapple, C. 2017. Work Interruptions Resiliency toward an Improved Understanding of Employee Efficiency. *Journal of Enterprise Effectiveness, People and Performance* (4)1:39-58.

Zwass, V. 2018. Information Systems. From: https://www.britannica.com/topic/information-system (accessed: 27 April 2018).

Annexure E: Proof of Registration



UNIVERSITY OF LIMPOPO

PROOF OF REGISTRATION : ACADEMIC YEAR 2020

This document is issued without alterations

Student Name Mr KXT Lamola

Student Number 200104744 TURFLOOP CAMPUS

	Qualification	Study Level	Faculty/School	Offering Type	Cost
1	MASTER COMMERCE	POST GRADUATE	MANAGEMENT AND LAW	FULL TIME POST GRADUATE [Y2+]	6,610.00

Qual #	Subject		Paper	Exam Date	Cost
1	CBMA890	DISSERTATION (BUSINESS MANAGEMENT)			.00

Non-Degree Purpose Registrations:

Subject	Paper	Exam Date	Cost

Other Costs:

Description	Cost
ADMINISTRATION FEE	1,883.00
SECURITY	600.00
Total for this registration	9,093.00

This document reflects costs for this Academic Registration only. It is not a Statement of Account

I hereby confirm and have satisfied myself that the above registration is correct

Signed: Student _____ Date _____

Registration Officer _____ Date _____

UNIVERSITY OF LIMPOPO
SCHOOL ADMINISTRATOR
17 -09- 2020
SCHOOL OF ECONOMICS & MANAGEMENT
PRIVATE BAG X1106, SOVENGA, 0727

Annexure F: Editor's Letter

Mr MM Mohlake
University of Limpopo
Turfloop Campus
Private Bag x 1106
Sovenga
0727

30 July 2020

To Whom It May Concern

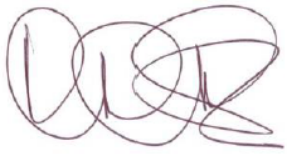
EDITING CONFIRMATION: Mr KXT LAMOLA's STUDY

This letter is meant to acknowledge that I, MM Mohlake, as a professional editor, have meticulously edited the main dissertation of Mr Kingston Xerxes Theophilus Lamola (Student No. 200104744) entitled "Factors Influencing the Adoption of Enterprise Application Architecture for Supply Chain Management in Small and Medium Enterprises within Capricorn District Municipality".

Thus I confirm that the readability of the work in question is of a high standard.

For any enquiries please contact me.

Regards



Mosimaneotsile M Mohlake
Freelance Professional Editor
(015) 268 2464
072 1944 452
mosimaneotsile.mohlake@ul.ac.za

Disclaimer: Subsequent alterations remain the responsibility of the author.

Annexure G: Turnitin and Plagiarism Report

FACTORS INFLUENCING THE ADOPTION OF ENTERPRISE APPLICATION ARCHITECTURE FOR SUPPLY CHAIN MANAGEMENT IN SMALL AND MEDIUM ENTERPRISES WITHIN CAPRICORN DISTRICT MUNICIPALITY

ORIGINALITY REPORT

13%	7%	8%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.isummation.com Internet Source	1%
2	Submitted to Polytechnic of Namibia Student Paper	1%
3	Andrea Metcalf. "Nationwide Training Limited were chosen by Action for Blind People to design an ILM middle manager leadership and management programme", Industrial and Commercial Training, 2015 Publication	1%
4	Submitted to Mancosa Student Paper	1%
5	www.ifc.org Internet Source	1%
6	www.bcce.ltjss.net Internet Source	<1%
7	Shura.shu.ac.uk Internet Source	<1%